



An IBM Exploration of Technology

Service Oriented Architecture in Action

Created for  **TechWorks**

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Overview

The information in this section provides preparatory information for the hands-on parts of this workshop.

Abstract

The Service-Oriented Architecture (SOA) in Action Exploration of Technology (EoT) provides an overview of SOA development and deployment with the IBM SOA Foundation. The workshop begins with an overview of Service-oriented Architecture and the IBM SOA vision. It continues with the basics of the technologies used to implement an SOA, and focuses on IBM's world-class tools and techniques for modeling, designing, constructing, and assembling service-based applications.

Introduction

Service-oriented architecture (SOA) isn't a new concept, but because of today's rapidly changing marketplace, complexity in information technology infrastructures, and the race to remain competitive, SOA has emerged as a key tool to help clients become on demand businesses. When you use business requirements to drive all downstream development activities, you close the gap between IT and business. In the context of service oriented design and development, the result is exceptionally flexible solutions that you can rapidly adapt to meet changing business needs and priorities.

Flexibility is a fundamental need for companies seeking to react to a rapidly changing landscape that includes emerging competitive threats, shifting compliance and regulatory requirements, mergers, acquisitions, and evolving technology. Just as important is the ability to align a core businesses process— software development—with business needs and priorities.

Objective

The objective of this session is to demonstrate the usage of key Rational and WebSphere tools and best practices to implement a business-driven approach for SOA.

Instructor Notes

Software Used in this EoT

- RequisitePro v7.0 with iFix 007
- Rational Method Composer v7.1.0
- Rational Method Composer RUP/SOMA (Service-Oriented Modeling and Architecture) Plug-in. Create configuration. Generate configuration instance. Point RSA v7.0 to use new configuration instance.
- WebSphere Business Modeler v6.0.2
- WebSphere Business Modeler RequisitePro Integration Plug-in v6.0.2
- WebSphere Integration Developer v6.0.2
- WebSphere Integration Developer RequisitePro Integration Plug-in v6.0.2

Running the Image

The image is set to auto-logon when Windows XP boots. If Windows XP does not auto-logon or the session is locked, use the following log on information.




- Login as: **techworks**
- Password: **passw0rd**

Instructor Notes

The labs are basically independent. You do not need to complete one lab in order to proceed to the next lab because they each use different workspaces, although to see requirement traces established in earlier modules, perform each lab sequentially. It is necessary to shut down all tools at the end of each lab. Start the tools as instructed at the start of each lab in order to ensure you are using the correct workspace.

Icons

The following symbols appear in this document at places where additional guidance is available.

Icon	Purpose	Explanation
	Caution!	This symbol warns you or calls attention to a particular step or command. For example, warning you to type a command carefully due to command case sensitivity.
	Information	This icon tells you information that may not be necessary to complete a step, but is helpful or good to know.
	Trouble-shooting	This icon tells you when a particular workaround has been found and you as the user can fix the problem by completing the associated troubleshooting information.

Lab 1. Analyze and Define Business Requirements

About WebSphere Business Modeler

IBM WebSphere® Business Modeler Version 6.0 provides business professionals with easy-to-use tools to design, improve and communicate complex business processes. Tailored for individual user requirements, IBM WebSphere Business Modeler Basic offers entry-level modeling capabilities that allow companies to capture processes at a lower cost per user. IBM WebSphere Business Modeler Advanced provides advanced modeling capabilities for advanced users and delivers sophisticated simulation and optimization capabilities that enable you to analyze the operational efficiency of business processes and potential business results—all before committing resources to development and deployment. Through WebSphere Business Modeler Advanced and WebSphere Business Modeler Basic, you can model the processes that can help you reap the full benefits of on demand business—and the flexibility you need to support and enable the world of integrated business processes.

IBM® WebSphere® Business Modeler Publishing Server Version 6.0 enhances WebSphere Business Modeler by providing a way to publish business processes and related business information, such as organization diagrams, to a secure Web site. This capability supports the development, documentation, and dissemination of business process models on an enterprise and worldwide scale.

About Rational RequisitePro

The IBM® Rational® RequisitePro® solution is a requirements and use case management tool for teams who want to improve the communication of project goals, enhance collaborative development, reduce project risk and increase the quality of applications before deployment. Uses advanced integration with Microsoft® Word to provide a familiar environment for activities such as requirements definition and organization. RequisitePro incorporates a powerful database infrastructure with real-time Word document synchronization to facilitate requirements organization, integration and analysis. Enables detailed attribute customization and filtering to maximize informative value of each requirement. Provides detailed traceability views that display parent/child relationships and show requirements that may be affected by upstream or downstream change.

Module Introduction

Business Process Optimization (BPO) efforts analyze critical business processes in an end-end fashion, decomposing them to a series of steps, or activities. Activities are used step-by-step to compose process models, with metrics documented for each activity. As-Is models represent the current state. To-Be Models represent a target state, and are derived by enhancing the As-Is model with changes arrived at through simulation and analysis.

Simulation is a capability supported by modeling tooling, that executes batches of process instances to generate cost and duration estimates based on the documented business metrics. Simulation of the As-Is model identifies areas for possible improvement. Simulation of To-Be models predicts the benefits of the changes.

For the purposes of this training module, you are a Business Analyst at JK Enterprises and part of a BPO effort called Project Enterprise with the overarching goals of reducing cost and cycle times. In the course of early BPO analysis, it became patently clear that Account Verification was a strategic reusable process whose improvement would greatly benefit the business. To this end, you are being asked to determine the impact of the process changes.

The following activities have already been completed in your project:

1. Model the As-Is process
2. Simulate the As-Is process
3. Analyze the As-Is process (using both Static and Dynamic Analysis)
4. Design the To-Be process (based on Business Goals and results of As-Is simulation and analysis)

In this module, you will complete, simulate and analyze the To-Be model, comparing it to the As-Is to understand the benefits of the To-Be design. You will then create and export your business measures (including Key Performance Indicators) for WebSphere Business Monitor, as well as BPEL for WebSphere Process Server (WebSphere Integration Developer).

Module Overview

- **1.1:** Review the Business Goals and Objectives
- **1.2:** Review the As-Is Model
- **1.3:** Review & Complete the To-Be Model
- **1.4:** Simulate, Analyze & Compare
- **1.5:** Export the Business Measures Model & BPEL



Important: If you encounter problems during the course of this exercise, please contact the class instructor or any of the module assistants.



Note: This module is intended to be completed in **30 minutes**.

1.1. Review the Business Goals and Objectives

Complete the following steps to review and act upon the assigned process enhancement request you recently accepted.

- ___1. Open RequisitePro.
 - ___a. Double-click the **Rational RequisitePro** shortcut on desktop. The Open Project window opens.



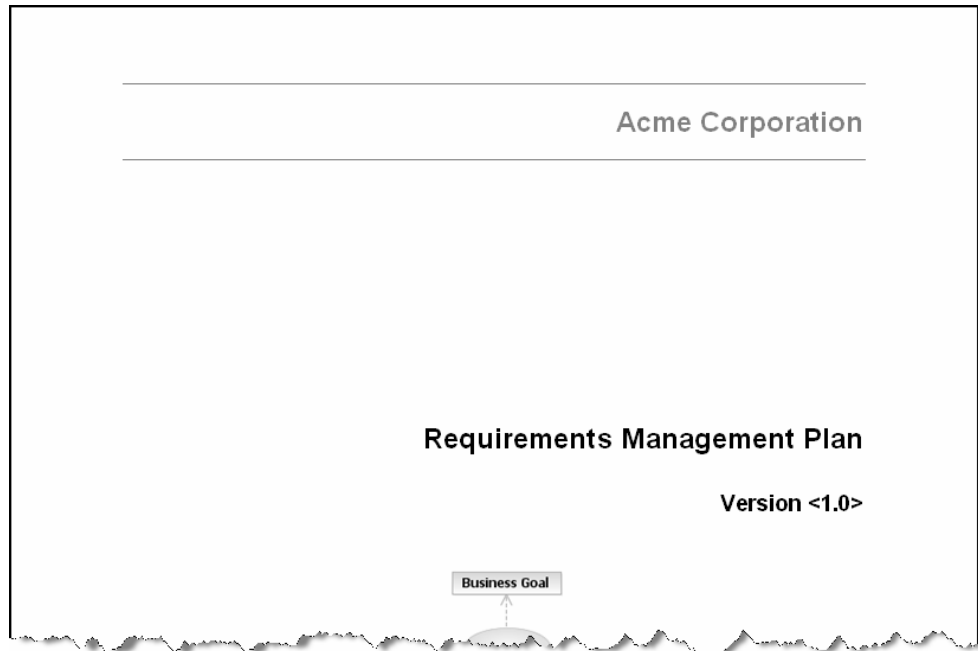
- ___b. Log in by selecting **Unknown** from the Username list.



- ___c. Click **OK**. The **Account Opening** project opens.

After understanding the enhancement request, we need to review the business requirements information previously documented in RequisitePro.

- ___2. Review the Requirements Management Plan
 - ___a. Right-click **Requirements Management Plan** in the Project Tree (bottom of list.)
 - ___i. Select **Open** from the emerging menu. The Requirements Management Document opens in Word. If Document Changed window appears, click **No**.



- ___ii. Review the contents of the Requirements Management Document.
- ___iii. Select **RequisitePro -> Document -> Close** to close Word. If the Document Changed window opens, click **No**.



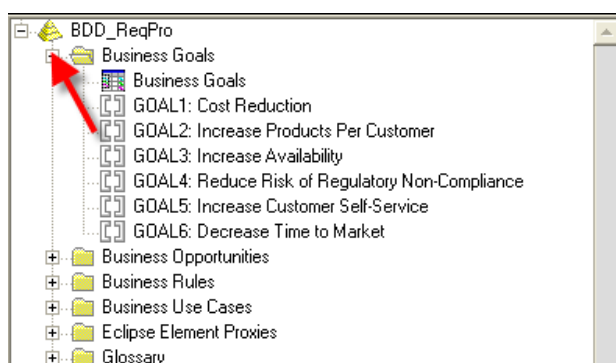
The Requirements Management Document will inform us of what requirement types are captured and the relationships of different types of requirements. This information is critical for us to understand prior to beginning our work.

This document defines the business goals requirements and the business use cases which trace to the business goals. Also, business opportunities are traced to the defined business opportunities. We also have system features and system use cases, system supplemental requirements, and business rules – which all linked to the business opportunity we are responsible for fulfilling.

To understand the defined business goals, complete the following steps:

- ___3. Review the business goals in detail.

___ a. Click  to expand the **Business Goals** folder in the Project Tree.



___ b. Right-click  **Business Goals**

___ c. Select **Open...** from the emerging menu. The Business Goal details will open.

Requirements:	ROI	Cost	Benefit	Priority
GOAL1: Cost Reduction Cost Reduction of 10% by 2007	1000000	20000	1020000	High
GOAL2: Increase Products Per Customer Increase Products Per Customer by 10% by 2007	250000	50000	300000	Medium
GOAL3: Increase Availability Increase Availability of On-Line Presence to 99.999%	25000	15000	40000	Low
GOAL4: Reduce Risk of Regulatory Non-Compliance Reduce Risk of Regulatory Non-Compliance	100000	20000	120000	Medium
GOAL5: Increase Customer Self-Service Increase Customer Self-Service via Internet to 85% by 2006	50000	5000	55000	Low
GOAL6: Decrease Time to Market Decrease Time to Market for New Products by 10% by 2007	250000	30000	280000	Medium
* <Click here to create a requirement>				Medium



Notice the Priority column that defines which Business Goals are of most importance. It is no coincidence that these goals are associated to our enhancement request. These goals were prioritized in strategic meetings and documented in the tool previously.

___ 4. Review the associated documentation.

___ a. Double-click on **Goal 1: Cost Reduction**. The previously captured documentation from the strategic meetings is opened in Word.

Requirements:


- GOAL1: Cost Reduction**
Cost Reduction of 10% by 2007
- GOAL2: Increase Products Per Customer**
Increase Products Per Customer by 10% by 2007

At present Credit Check activities are handled manually by a team of Account Coordinators in each region who are notified via a paper form to phone or fax the "appropriate" credit reporting agency to retrieve the customer's credit score. The Account Coordinators then score the customer using regionally determined policy to decide whether or not to support the new account. The fees vary greatly by region and agency even when multiple regions used the same agency. Since the scoring policies differ by region, there is little consistency -- the same customer might be accepted or denied depending upon what region he is in when he applies.

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Business Goals

[GOAL1 Cost Reduction of 10% by 2007](#)
[GOAL2 Increase Products Per Customer by 10% by 2007](#)
[GOAL3 Increase Availability of On-Line Processes 99.999%](#)

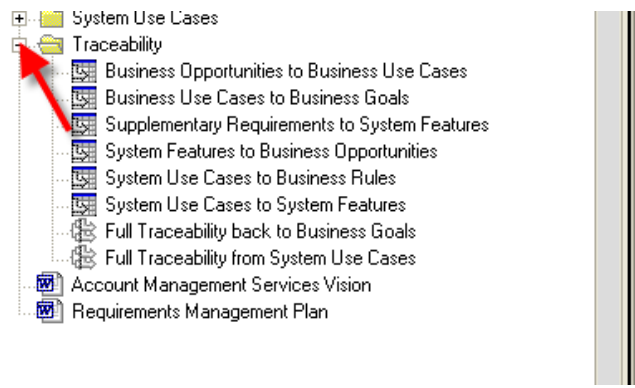
 *RequisitePro closely integrates with Microsoft Word allowing the user to mark text in Word documents as formal requirements.*

Now that we understand the highest priority business goals and the context in which those business goals exist, it important to understand how our existing business processes are related to our business goals.

___b. Select **RequisitePro -> Document -> Close** to close Word.

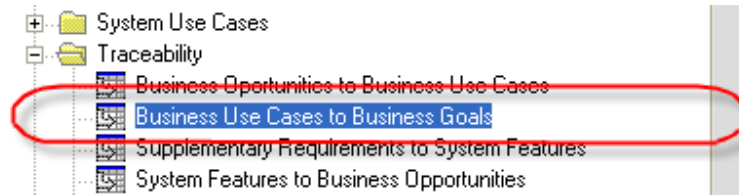
___5. Review Business Goals Traceability.

___a. Click  to expand the **Traceability** folder in the Project Tree.



- System Use Cases
- Traceability
 - Business Opportunities to Business Use Cases
 - Business Use Cases to Business Goals
 - Supplementary Requirements to System Features
 - System Features to Business Opportunities
 - System Use Cases to Business Rules
 - System Use Cases to System Features
 - Full Traceability back to Business Goals
 - Full Traceability from System Use Cases
- Account Management Services Vision
- Requirements Management Plan

- ___b. Double-click **Business Use Cases to Business Goals**. The relationship of the business use case (business process) opens.



Relationships:
- direct only

	GOAL1: Cost Reduction	GOAL2: Increase Products Per Customer	GOAL3: Increase Availability	GOAL4: Reduce Risk of Regulatory Non-Compliance	GOAL5: Increase Customer Self-Service	GOAL6: Decrease Time to Market
BUC1: Activate Account						
BUC2: Apply for Account						
BUC3: Open Account						
BUC4: Verify Account						
BUC4.1: Verify Account Brief...						
BUC6: Set Up New Customer						



Notice that arrows exist in the column for Goal 1 and Goal 5. According to the traceability view, by focusing on the Account Verify process we can achieve two business goals by optimizing the Account Verification process. Also note the arrows with the red lines through them. This indicates a suspect link, when you modify the requirement name, text, requirement type, or attributes associated with one or both of the requirements, a suspect link is generated causing the relationship to require attention. Only direct traceability relationships become suspect. Indirect relationships are not affected.

- ___6. Close Rational RequisitePro
 - ___a. Select **File -> Exit** to close RequisitePro. The Project Close window opens.
 - ___b. Click **Yes**. If asked to save any views, click **No**.

1.2. Review the As-Is Model

- ___7. Start WebSphere Business Modeler Advanced Edition Version 6
 - ___a. Double-click on the **WebSphere Business Modeler** icon on the desktop. Click **OK** on the WebSphere Business Modeler follow up dialog box.

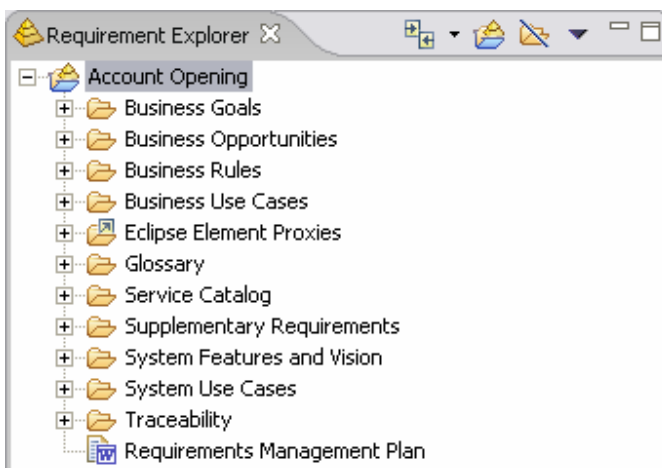


Note: WebSphere Business Modeler is an eclipse-based tool (for more information on eclipse, visit www.eclipse.org). We will use the Business Modeling perspective. When WebSphere Business Modeler starts, the Account Verification (As-Is) model should be open in a single pane.

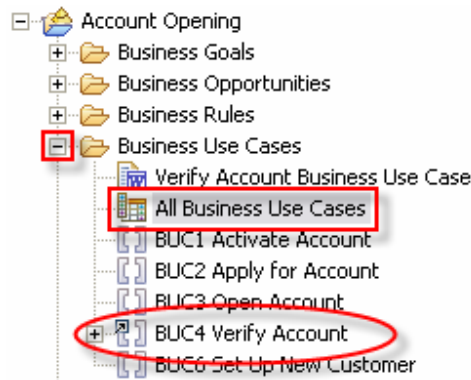
- ___8. Review Business Model traceability to Requirements
 - ___a. Double-click on **Account Opening** project in the **Requirement Explorer** view



- ___b. Press **OK** on the next screen to use the **Unknown** user for logon to RequisitePro
- ___c. Click the + sign next to **Account Opening** to view the contents of the RequisitePro requirements project




- ___d. Expand **Business Use Cases** and double-click on the **All Business Use Cases** view to see the **Requirement Query Results** view.

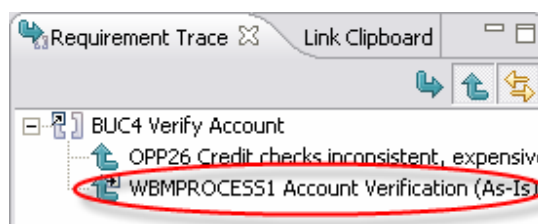


Requirement	Priority	Status	Difficulty	Stability
BUC1 Activat...	Medium	Approved	Medium	Medium
BUC2 Apply f...	Medium	Approved	Medium	Medium
BUC3 Open A...	Medium	Approved	Medium	Medium
BUC4 Verify ...	High	Approved	Medium	Medium
BUC4.1 Verif...	Medium	Approved	Medium	Medium
BUC6 Set Up ...	Medium	Approved	Medium	Medium



*Note: The RequisitePro integration with WebSphere Business Modeler provides many of the same features found in the RequisitePro native client interface, but with the added benefit of being able to trace business modeler elements to requirements. In the above images, **BUC4 Verify Account** is circled because this requirement is linked to a business model element, denoted by the small arrow on the brackets ().*

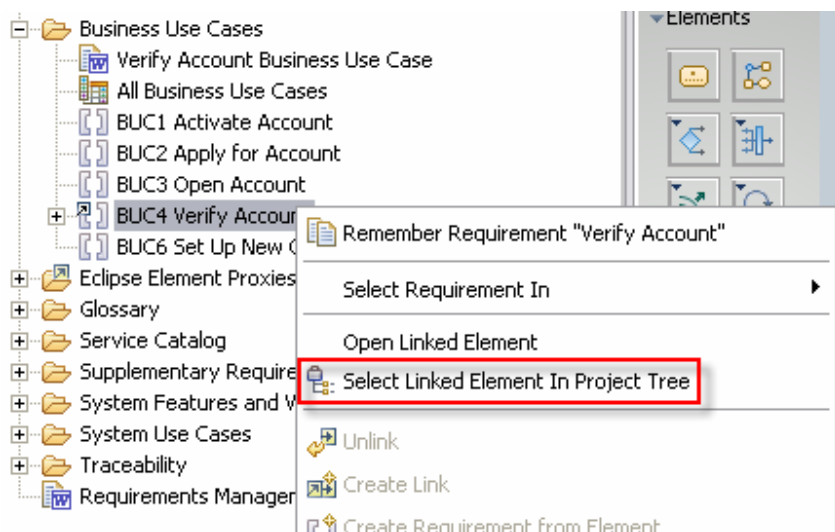
___e. Click once on **BUC4 Verify Account** in the Requirement Explorer view.



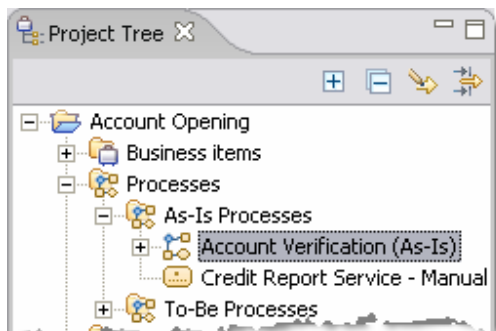
Note: It's of importance to note that when a requirement is selected in the Requirement Explorer view, the Requirement Trace view is updated on the selected requirement providing a look into requirements which trace-to or trace-from the selected requirement.

Since the BUC4 Verify Account requirement was just selected, the view shows that the WBMPROCESS1 Account Verification (As-Is) business process is already traced to this business use case indicating the business modelers intent of software implementation.

___f. Right-click on **BUC4 Verify Account** and click **Select Linked Element In Project Tree**.

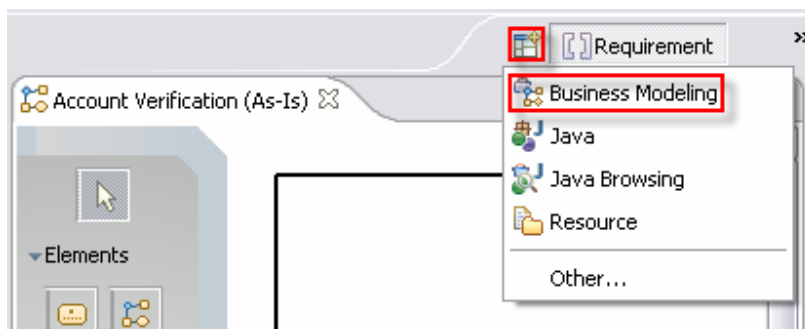


___g. Note that the **Account Verification** process is selected in the Project Tree view indicating its traceability to the BUC4 Verify Account business use case.

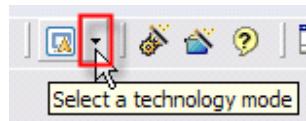


___9. Review the Account Verification (As-Is) Process Model

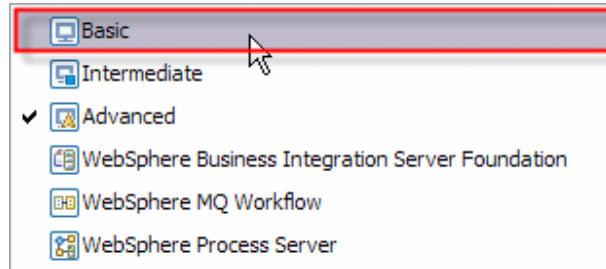
___a. Change to the **Business Modeling** perspective by using the drop-down selection in the upper right portion of WBM and selecting **Business Modeling**.



___b. Click the **Select a technology mode** down-arrow button on the toolbar.

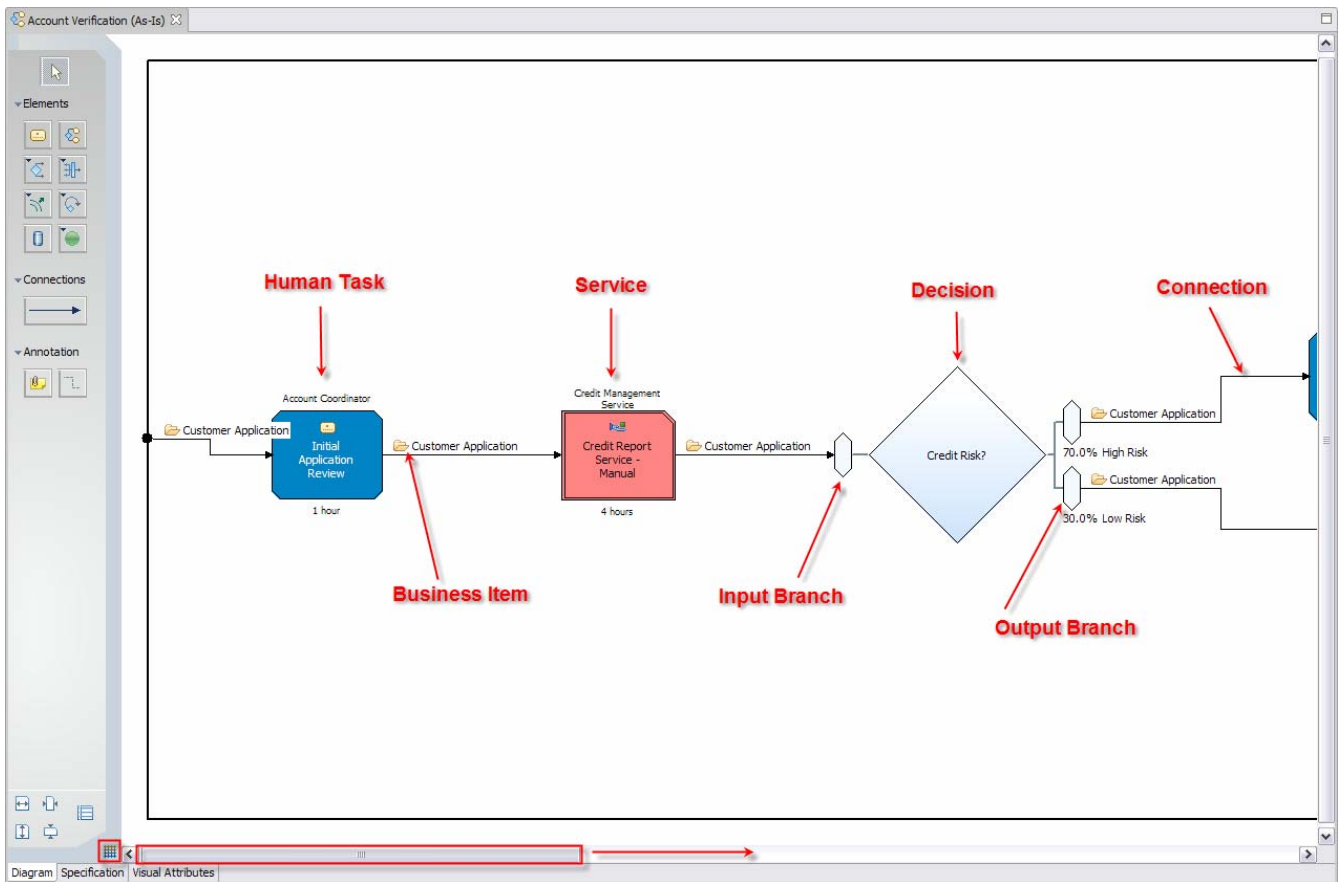


___c. Select **Basic** mode from the menu.



Note: The diagram now displays less detail.

___d. Review the **Account Verification (As-Is)** process model in the Process Editor pane.



Note: In the Account Verification (As-Is) process, an Account Coordinator reviews the customer application and researches information on several different systems and then calls or faxes the Credit Agency to request a credit report. Since we call or fax the Credit Agency (and require faxed credit reports) the current agency does not provide us favorable pricing. We do not differentiate between high and medium risk customers; this results in a large number of declined requests – far above the typical percentage for our industry. In our current process, most applications are considered “High Risk” and must go through additional steps, including Request More Information, which requires that the customer provide additional financial documentation and adds an average of 3 days to the process. Finally, the Account Coordinator manually generates an approval or decline. The pricing for the approval is determined by referencing complicated paper manuals.

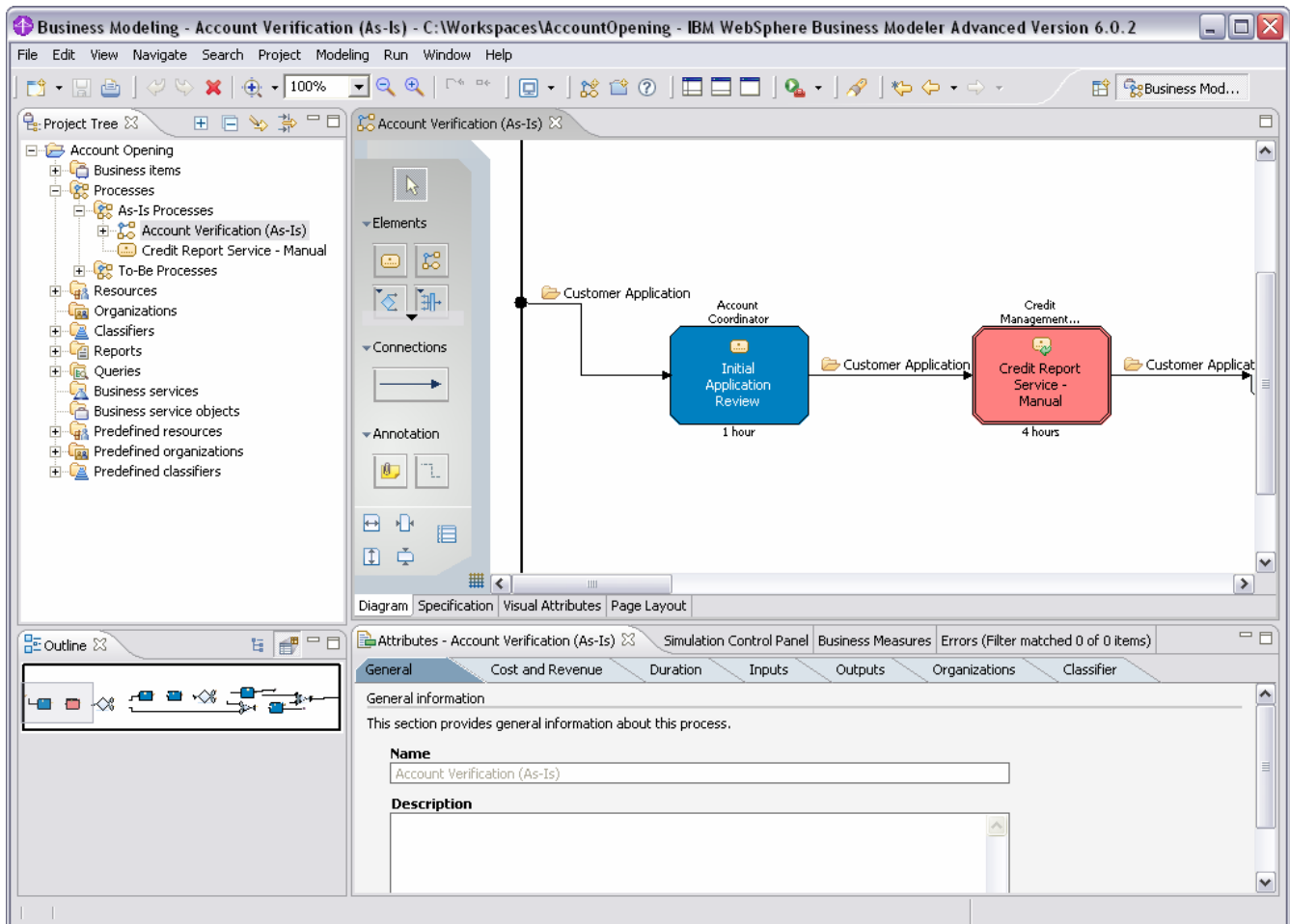
Based on the As-Is model, analysis and simulation, we have identified several areas for improvement:

- Lack of single customer view and business rules for credit process result in our ordering more credit reports than we need.
- Manual process for retrieving credit reports is highly inconsistent, expensive and time consuming.
- Credit Report requests are manually faxed to the bureau, cost \$25 and take 4 hours to arrive.
- We decline too many customer requests, resulting in loss of potential revenue and dissatisfied Sales representatives.
- Too many customers are falling under the “High Risk” category and are asked to provide additional credit worthiness information, increasing the time to open the account by an average of 3 days resulting in dissatisfied customers.
- The Initial Application Review task requires that the Account Coordinator log on to several systems to gather critical decision-making information resulting in increased errors and increased lower throughput.

- Average Elapsed Duration: 2 days 9 hours 27 minutes – exceeds industry averages and results in dissatisfied customers
- Weighted Average Profit: \$184.43 –below industry averages and could be improved.

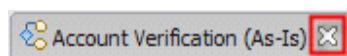
___e. Select the **Apply 4-pane layout** button  from the toolbar.

___f. Review the WebSphere Business Modeler in 4-pane Layout.



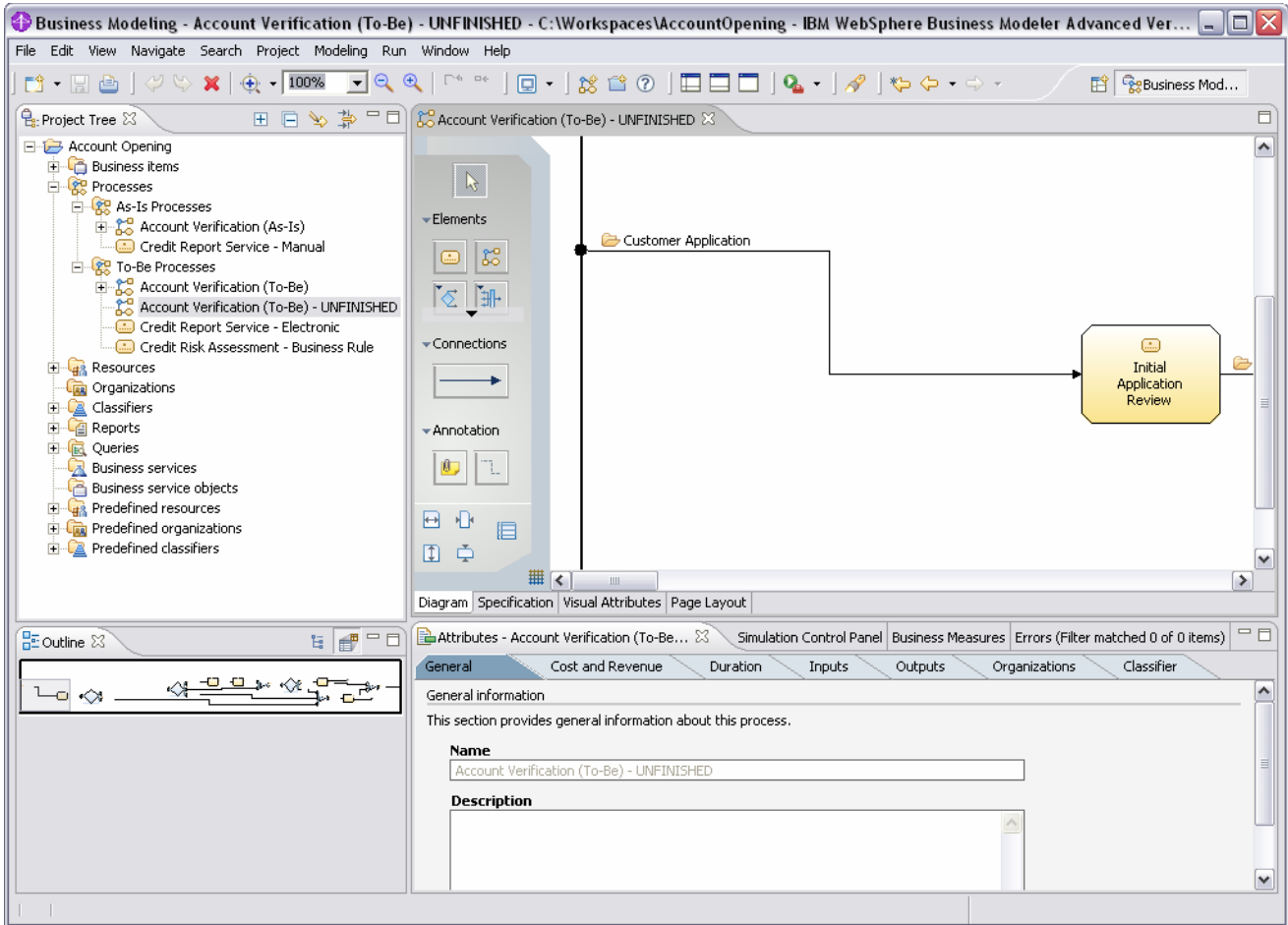
Hint: You can click on tasks to review the attributes for each task in the Attributes pane below the diagram.


___g. **Close** the diagram by **clicking** on the **X** next to the diagram name in the Process Editor.



1.3. Review & Complete the To-Be Model

- ___10. Open the Account Verification (To-Be) Model and Review
 - ___a. Expand the **To-Be Processes** catalog and double-click on the **Account Verification (To-Be) – UNFINISHED** process to open it.



- ___b. Select the **Apply 1-pane layout button**  from the toolbar.
- ___c. Review the **Account Verification (To-Be) – UNFINISHED** model.

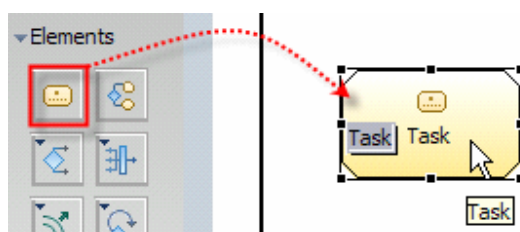
Note: When completed, this process will have the following improvements:

- Automated gathering of critical data, via a new Determine Applicant Eligibility service, will reduce process duration and the number of required credit reports requests.
- Addition of Credit Report Needed? decision, will provide automated approval of customers with credit reports on file, with existing relationships or pre-qualified applications. This will result in cost-savings, reduced cycle times, more applications approved and higher customer satisfaction.
- Automated (electronic) credit report service will be significantly less expensive, flexible and faster – it will allow us to “shop around” for the least expensive service provider.

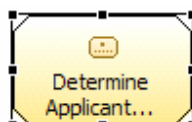
- Dynamic, rules-based risk assessment that can be changed as necessary based on business need, via a new Credit Assessment Business Rule, that will add the ability to respond to market pressures and opportunities more quickly.
- New Medium Risk path. Risk will be mitigated by a Final Application Review by an Account Manager and will allow us to avoid the 3-day average Request More Documentation step and will result in reduced process duration and increased percentage of applications approved.
- Automated Provide Pricing & Approval and Generate Decline services will reduce average process duration and cost.

___ 11. Add a **New Task** and Set its Attributes

- ___ a. **Click** on the **Create local task** button on the palette and **move** your **cursor** to the process diagram. **Click** anywhere in the **white space** to add a new task.



Reminder: You do not need to “drag” the elements from the palette to the diagram. Click the appropriate button on the palette, move your cursor to the desired location in the Process Editor and click again to add.

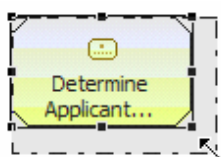



- ___ b. Type the name **Determine Applicant Eligibility** as the new task name.

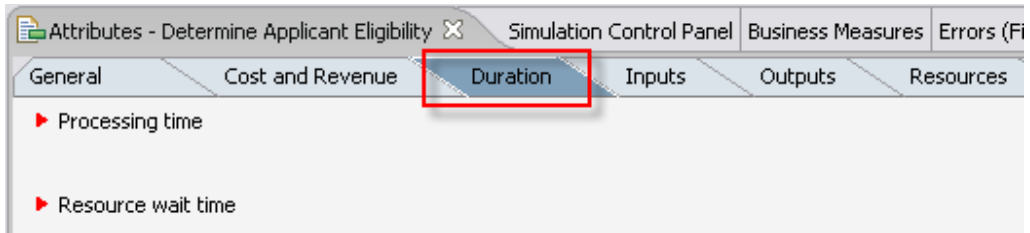


Hint: If the task name is no longer highlighted and editable, click the task once and then type the task name. You may need to click twice, once to select the task, and another to edit the name.

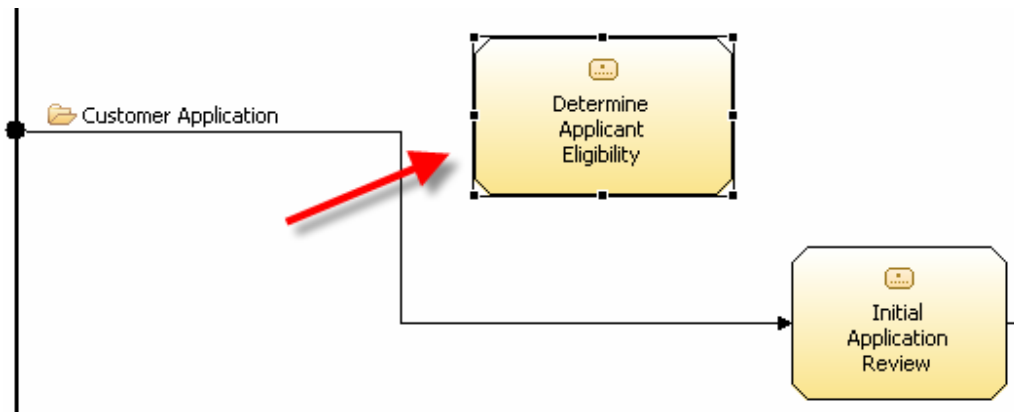
- ___ c. **Resize** the **task** so the entire name is viewable by **clicking** on the task once and then **clicking** and **dragging** any of the black dots along the border of the task (you may need to first select the task by clicking on it once).




- ___d. Select the **Apply 2-pane layout** button  from the toolbar. You will see the Attributes pane appear below the Process Editor.
- ___e. With **Determine Applicant Eligibility** selected, click on the **Duration** tab in the **Attributes – Determine Applicant Eligibility** pane and click on the **red arrow** by **Processing Time** to reveal its settings.



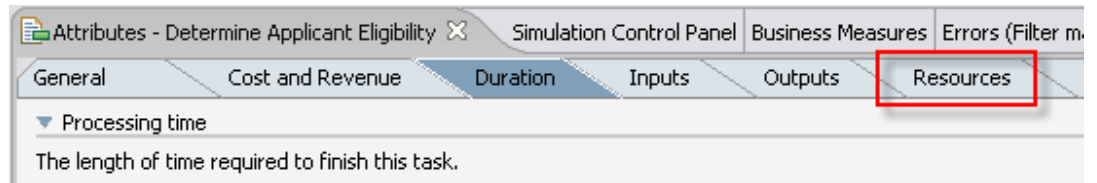
 *Note: Be sure that the **Determine Applicant Eligibility** task is already selected by clicking on it once.*



- ___f. Click the **up** arrow next to **Seconds** until it reads **10** seconds. 


 *Note: You can also place your cursor in the box, delete the 0 and type 10.*

- ___g. In the **Attributes – Determine Applicant Eligibility** pane, click on the **Resources** tab.

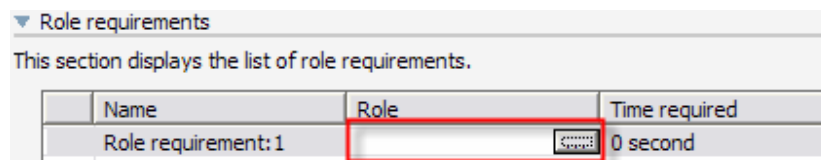


*Note: Be sure that the **Determine Applicant Eligibility** task is already selected by clicking on it once.*

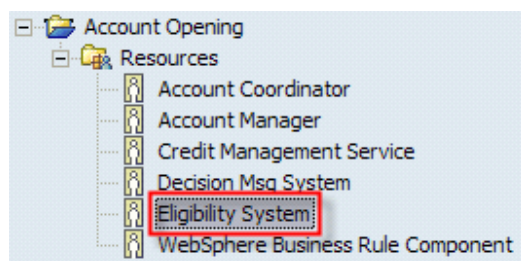
___h. **Click** the red arrow next to **Role requirements** to expand the selections.

___i. **Click** the **Add** button to the right of the Role requirements table. 


___j. **Click** once in the **cell** under the **Role** column heading and **click** on the  button.



___k. **Select Eligibility System** from the Select Role Requirement dialog and **click** the **OK** button.



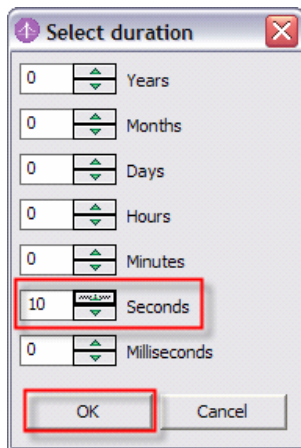
Note: In the diagram, the task color and upper label will change accordingly.

___l. **Click** inside the **Time Required** cell that says **0 second** and **click** on the  button.




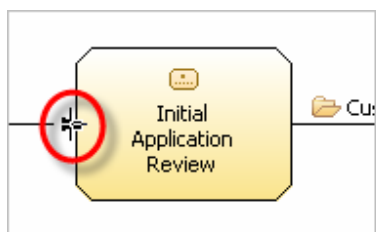
Note: Since we would like to run to run simulations using either required resource time or task (elapsed) duration, we should specify the Time Required metric, which in this case, happens to be the same as the task duration (10 seconds). Resource Time Required can also be thought of as working duration.

- ___m. In the **Select Duration** dialog box, **click the up** arrow next to **Seconds** until it reads **10** seconds

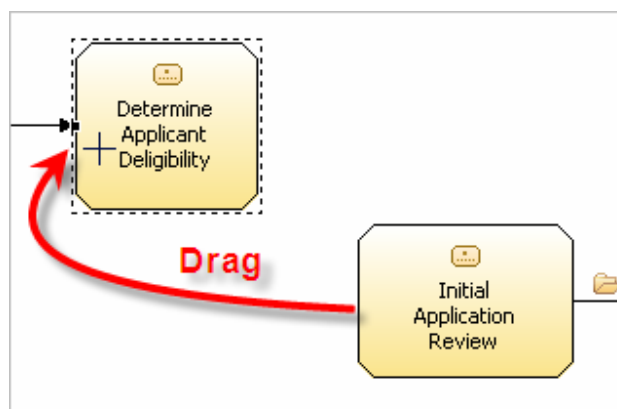


Note: You can also place your cursor in the field; delete the 0 and type 10.

- ___n. **Click the OK** button.
- ___o. **Select the Apply 1-pane layout button**  from the toolbar.
- ___p. **Click the connection** that leads into the **Initial Application Review** task, once.
- ___q. **Move** your cursor over the point of the **connector arrow** that connects into the **Initial Application Review** task, until your cursor becomes cross-hairs.



- ___r. **Click** and **drag** the **connection** arrow to the **Determine Applicant Eligibility** task and **click** anywhere **inside the task** to re-connect the connection.

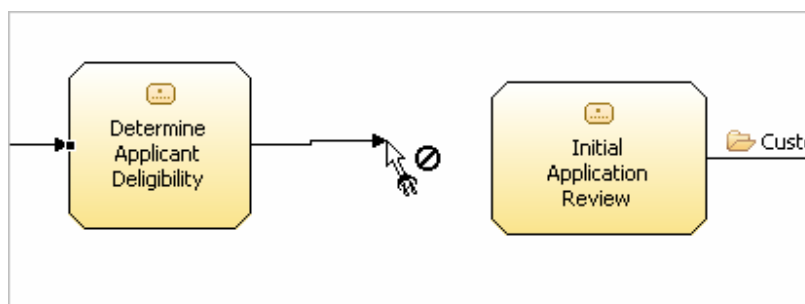


- ___s. **Press Ctrl + S** on your keyboard to save your changes.

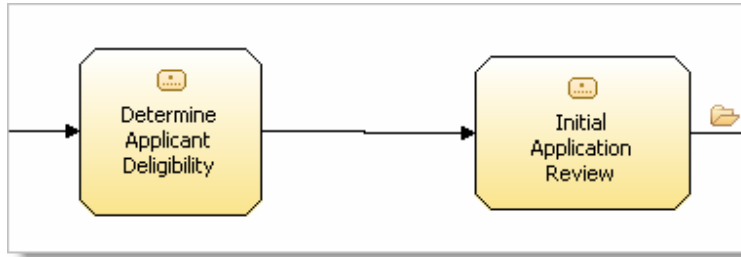
___12. Add a Connection

A connection is a link between two elements and can be used to specify the chronological sequence of activities in a process. Each task, subprocess, decision, or other element passes control to the next task or element along a connection. You can also associate business items with connections to pass data from element to element.

- ___a. **Click** the **Connections** button on the palette, **move** your cursor to and **click** on the **Determine Applicant Eligibility** task. You should now have a connector attached to the task and to your cursor.



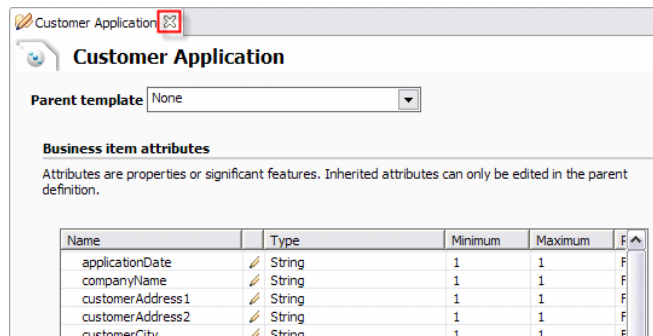
- ___b. **Click** anywhere inside the **Initial Application Review** task to finish the connection.



___c. **Press the Esc key** on your keyboard to return to the default cursor.

 *Note: You can also click on the  button on the palette to return to the default cursor.*

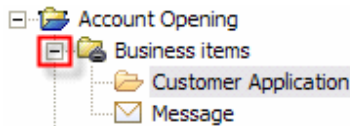
___13. Add a Business Item



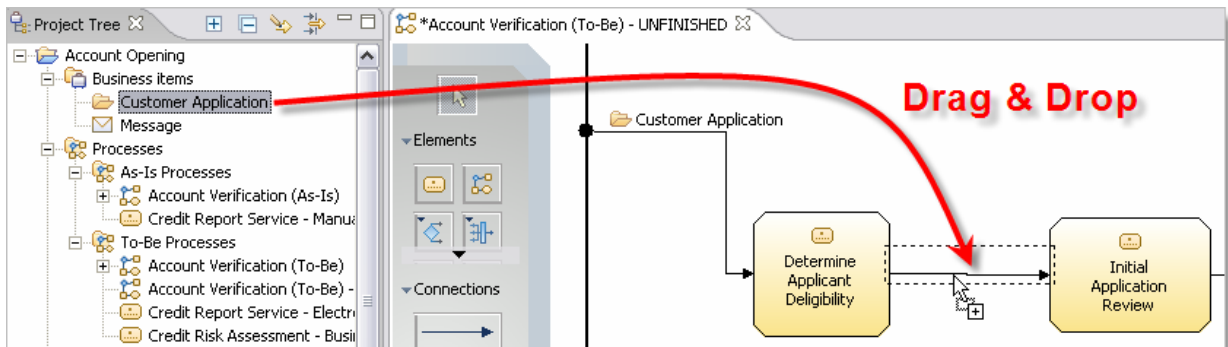
Business items represent the data in our process and contain attributes that can be basic types, like String and Integer, or Complex types, like other business items. Business items can also inherit attributes from a parent template. Attributes can have rules (expressions) associated with them. Optional: Double-click on the Customer Application business item to view its attributes and close it by clicking the X in the Customer Application tab.

___a. **Select the Apply 4-pane layout** button  from the toolbar

___b. **Expand the Business Items** catalog so that you can see the Customer Application and Messages business items.



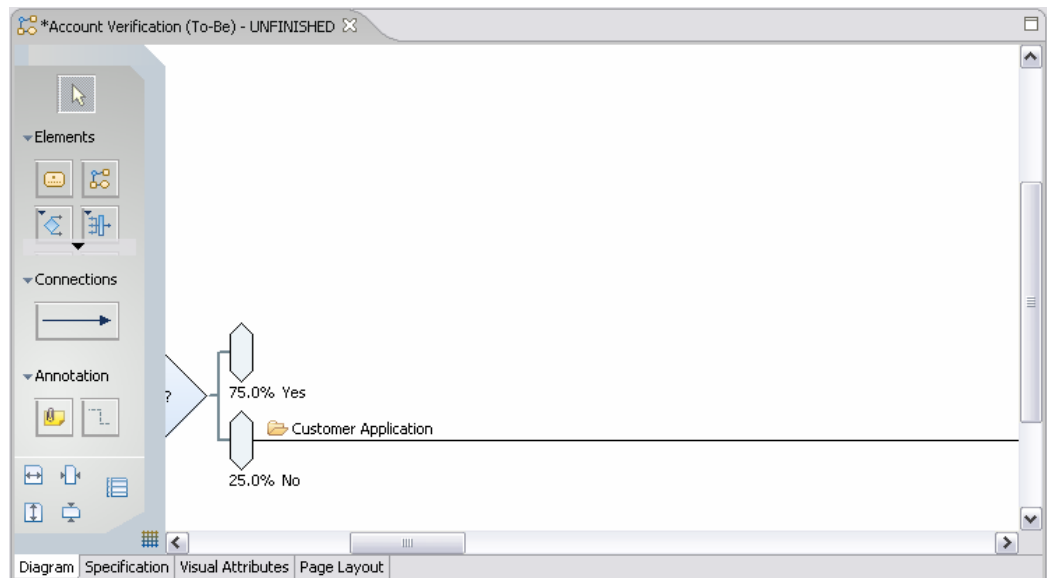
___c. **Click and drag the Customer Application** business item to the connection between **Determine Applicant Eligibility** and **Initial Application Review**.



___d. **Press Ctrl + S** on your keyboard to save your changes.

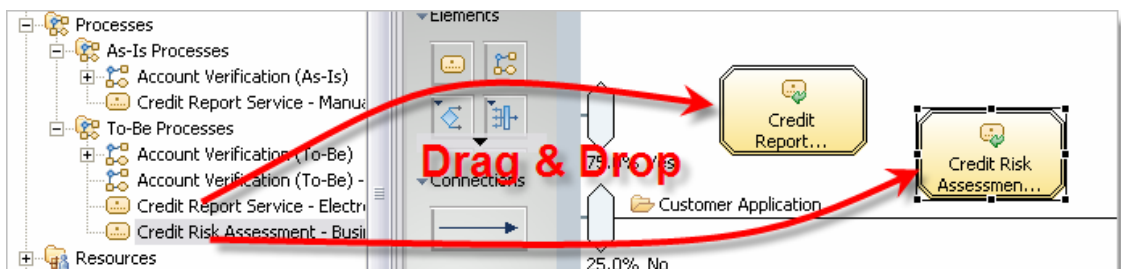
___14. Add a Global Task and a Service

___a. Rearrange the Account Verification drawing surface to the right just past the **Yes** connection by **dragging the lower scrollbar** to the right.

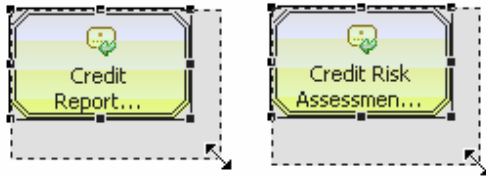


___b. **Click and drag** the **Credit Report Service – Electronic** service from the Project Tree to the canvas and release the mouse button to place.

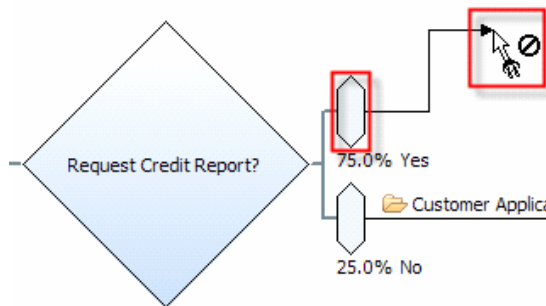
___c. **Click and drag** the **Credit Risk Assessment - Business Rule** global task from the Project Tree to the canvas and release the mouse button to place.



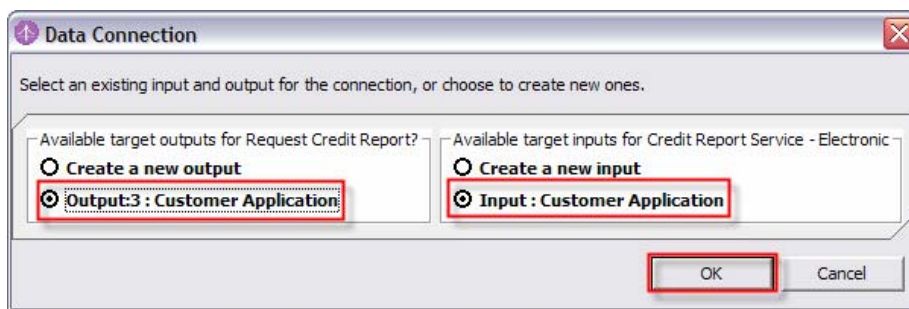
- ___d. **Resize** both new **tasks**, so their names are entirely viewable, by **clicking** on each task once and then **clicking** and **dragging** any of the black dots along the border of the task.



- ___e. **Click** the **Connections** button on the palette and then **click** on the **Yes** branch of the **Request Credit Report?** decision to begin a connection. You should now have a connector attached to the **Yes** branch and to your cursor.




- ___f. **Click** anywhere inside the **Credit Report Service - Electronic** service to finish the connection.
- ___g. You will be prompted to select the existing input and output or create new ones. By default, the existing input and output should be selected. **Click** the **OK** button to accept the defaults in the Data Connection dialog.

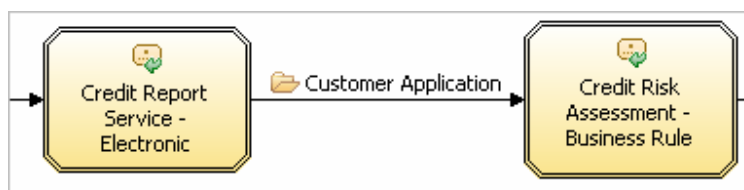


- ___h. **Click** anywhere inside the **Credit Report Service - Electronic** service to begin a connection.

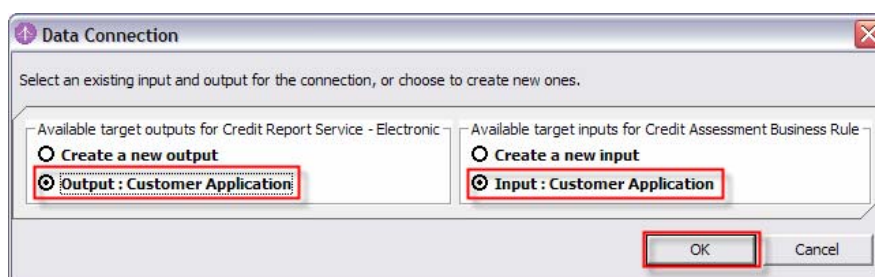


Note: Your cursor should still look as follows . If not, click the Connections button in the toolbar again, before adding more connections.

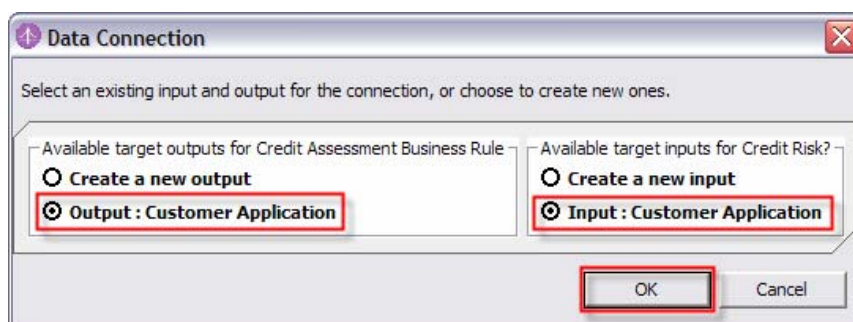
- ___i. **Click** anywhere inside the **Credit Assessment Business Rule** global task to finish the connection.



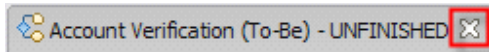
- ___j. **Click** the **OK** button to accept the defaults in the Data Connection dialog.



- ___k. **Click** on the **Credit Assessment Business Rule** task to begin a connection.
- ___l. **Scroll** to the **right** until you see the **Credit Risk?** decision.
- ___m. **Click** the **input** branch of the **Credit Risk?** decision to finish the connection.
- ___n. **Click** the **OK** button to accept the defaults in the Data Connection dialog.

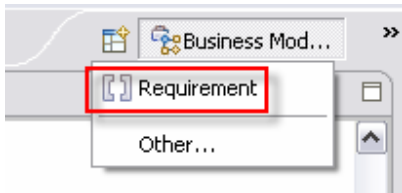


- ___o. **Press** the **Esc** key on your keyboard to return to the default cursor.
- ___p. **Right-click** on any **white space** in the diagram and select **Auto-Layout Left to Right**.
- ___q. **Press** **Ctrl + S** on your keyboard to save your changes.
- ___r. **Close** the diagram by **clicking** on the **X** next to the diagram name in the Process Editor.



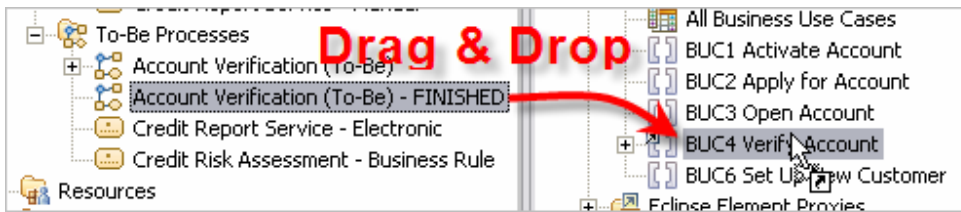
___15. Link Updated Account Verification business process

___a. Change back to the Requirement perspective by clicking on the >> then **Requirement**

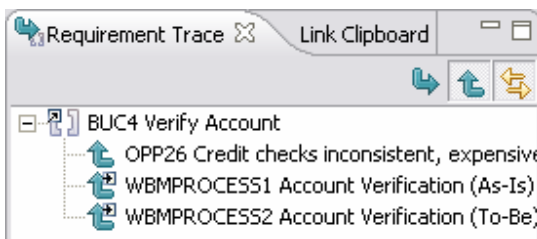


___b. Right-click **Account Verification (To-Be) – UNFINISHED** in the Project Tree and select **Rename**. Remove the “UN” characters and press Enter to indicate the To-Be is finished. Scroll the Project Tree view to the right to see the name editor.

___c. **Left-click** on the **Account Verification (To-Be) – FINISHED** business process in the Project Tree view and **drag while holding the left mouse button** to the **BUC4 Verify Account** business use case in the Requirement Explorer. **Release** the left mouse button. A link is made between the process and the requirement.



___d. Left-click **once** on the **BUC4 Verify Account** business use case. Notice in the Requirement Trace view both the As-Is and To-Be business models now trace to the business use case requirement.

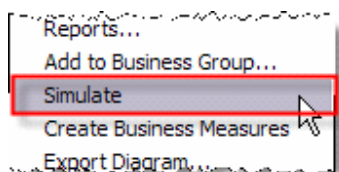


___e. Switch back to the **Business Modeling** perspective.

1.4. Simulate, Analyze & Compare

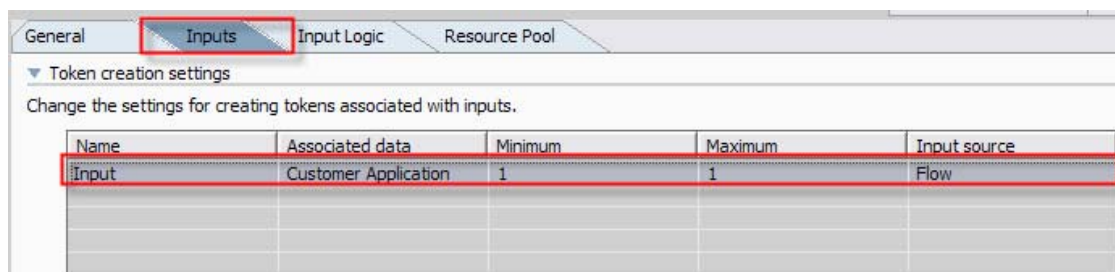
___16. Create a Simulation Snapshot

- a. Right-click on the **Account Verification (To-Be) - FINISHED** model in the Project Tree and select **Simulate**.

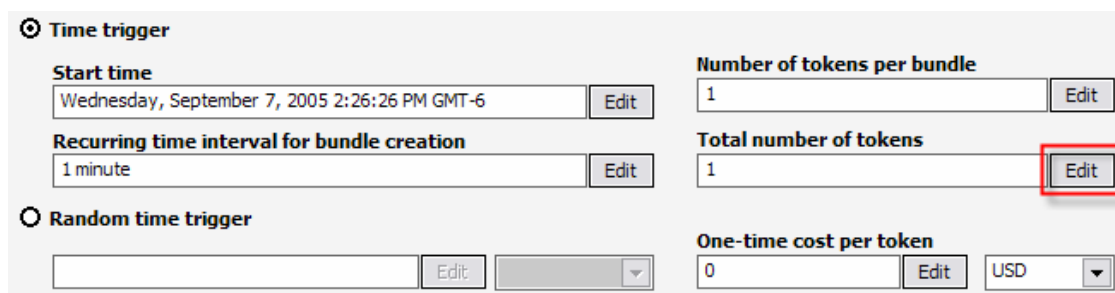


- b. Select the **Apply 2-pane layout** button  from the toolbar.

- c. In the Attributes pane, click on the **Inputs** tab and then click on the **first row** of data in the table.

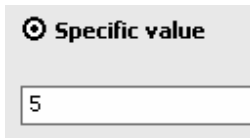


- d. Scroll down in the **Attributes** pane to see the settings.
- e. Click on the **Edit** button next to the **Total number of tokens** field.



Note: Tokens are the inputs to our process model, in our case, they are Customer Applications.

- f. Highlight the existing number **1** and then **type** the number **5** in the **Literal value** field of the **Edit simulation attribute** dialog box.



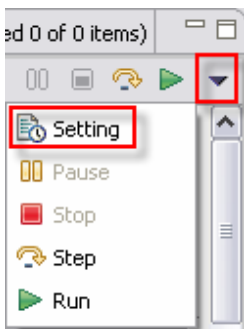
- ___g. Click the **OK** button in the dialog box.
- ___h. Press **Ctrl + S** on your keyboard to save your changes.

___17. Run a Simulation

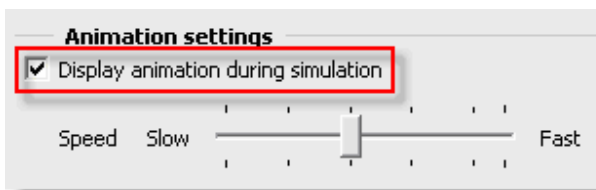
- ___a. **Click** on the Simulation Control Panel



- ___b. Click on the **Menu** drop down arrow. Select **Setting**.



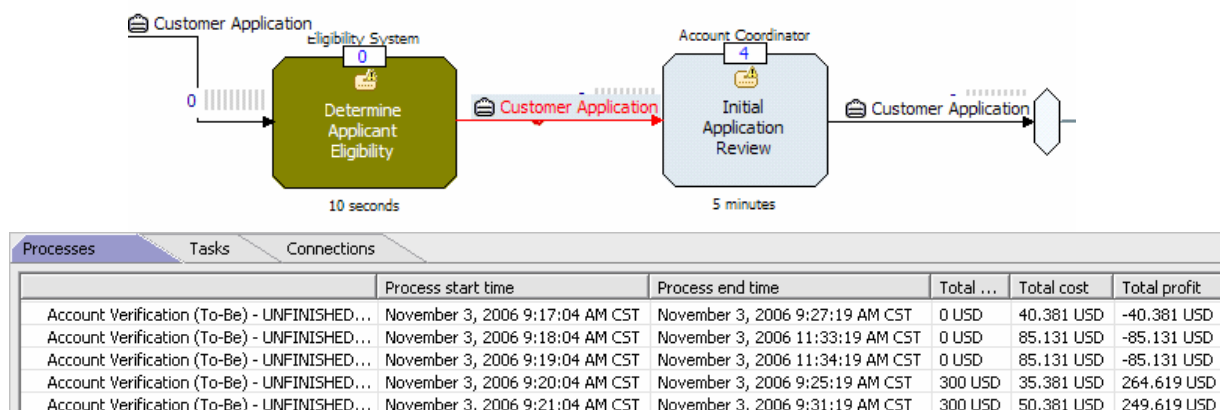
- ___c. Under Animation Settings, check the “**Display Animation during Simulation**”



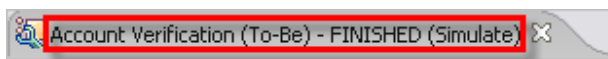
- ___d. Click **OK** to close dialog box
- ___e. Click the **Run Simulation** button on the far right side of the Simulation Control Panel.



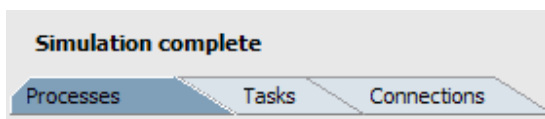
- ___f. Observe the simulation in the diagram and the statistics that are being collected.



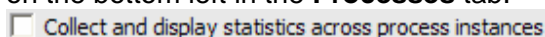
___g. When the simulation completes, double-click on the **Simulation Control Panel** tab to maximize.



___h. Review the simulation statistics by clicking on each of the tabs: **Processes**, **Tasks** and **Connections**. Resize columns as needed.



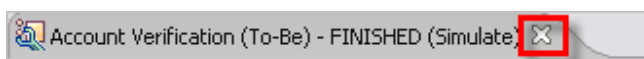
___i. Click on the **Collect and display statistics across process instances** checkbox on the bottom left in the **Processes** tab.




 *Note: This displays averages across all process instances for the simulation results.*

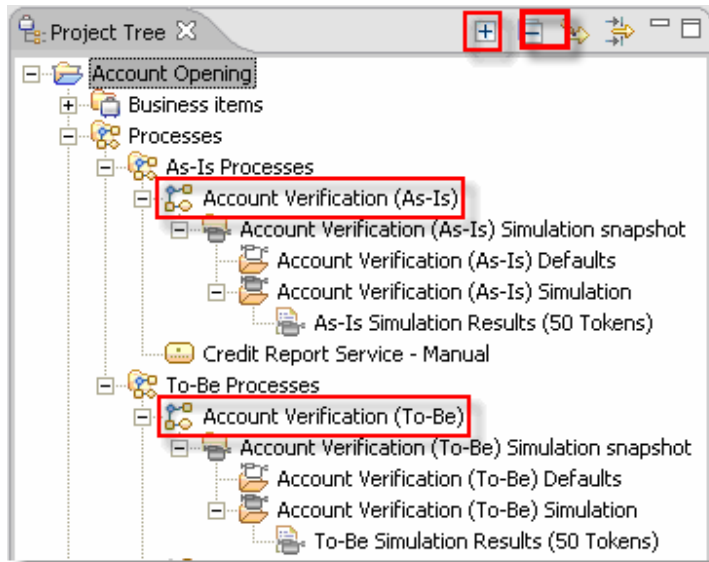
___j. Double-click on the **Simulation Control Panel** tab to return it to its previous size.

___k. Close the diagram by clicking on the **X** next to **Account Verification (To-Be) – FINISHED (Simulate)** the diagram name in the Process Editor.



___18. Dynamic Analysis

- ___ a. Select the **Apply 4-pane layout** button  from the toolbar.
- ___ b. In the Project Tree view, click the **Account Verification (To-Be)** process once and click on the **Expand selection** button.

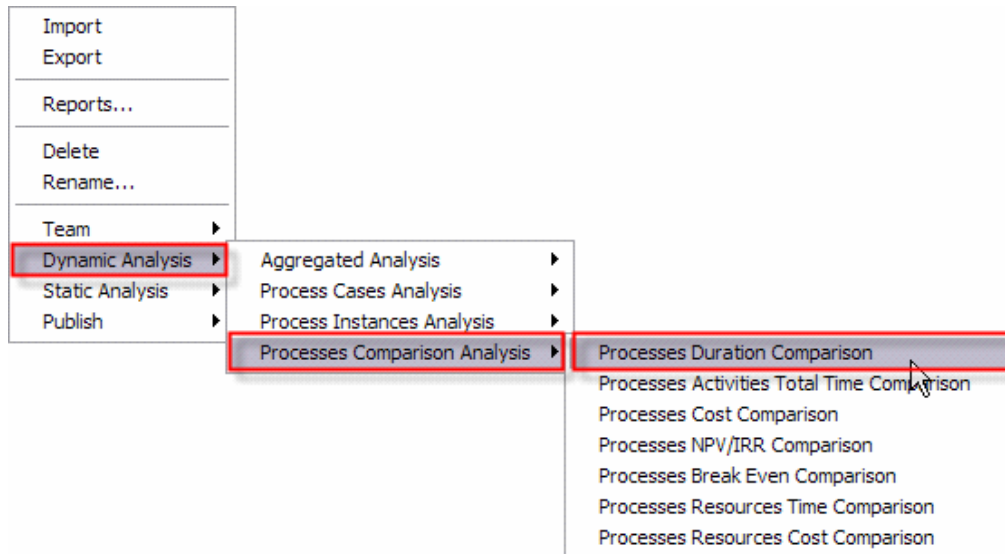


- ___ c. **Click the Account Verification (As-Is) process once and click on the Expand selection button in the Project Tree.**

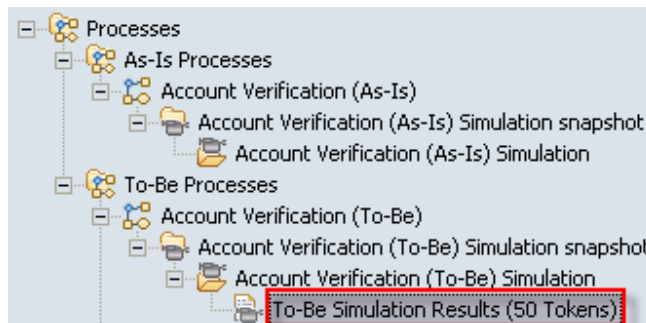


Note: The Account Verification (To-Be) and (As-Is) processes were completed in advance and contain simulation results (using 50 tokens) that we will use for our analysis.

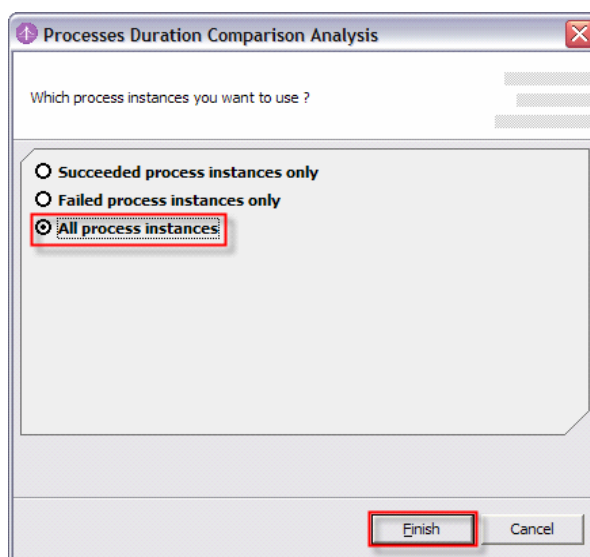
- ___ d. **Right-click on As-Is Simulation Results (50 Tokens) and select Dynamic Analysis -> Process Comparison Analysis -> Process Duration Comparison.**



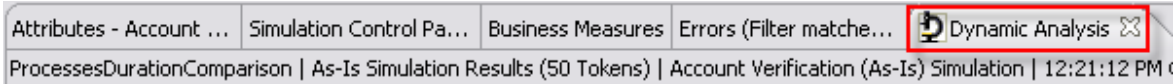
___e. Select **TO-BE Simulation Results (50 Tokens)** and Click **OK**



___f. Select **All process instances** and click **Finish**.



- ___g. Click the **Yes** button if any information windows appear.
- ___h. Double-click the **Dynamic Analysis** view tab to maximize it.



- ___i. Review the results. Resize columns as necessary.

Processes Duration Comparison As-Is Simulation Results (50 Tokens) AS-IS Simulation Profile 1 9:33 AM				
	Simulation Result Name	Process Name	Average Elapsed Duration	Average Throughput
	As-Is Simulation Results (50 Tokens)	Account Verification (As-Is)	3 days 22 hours 46 minutes 29 seconds	0.01 work item / hour
	To-Be Simulation Results (50 Tokens)	Account Verification (To-Be)	1 day 5 hours 55 minutes 46.032 seconds	0.03 work item / hour
Difference			2 days 16 hours 50 minutes 42.968 seconds	-0.02 work item / hour
Percentage Change			68.42%	-216.66%

- ___j. Double-click the **Dynamic Analysis** view tab to return it to its previous size.
- ___k. Click on the **X** next to the **Dynamic Analysis** view diagram to close.

1.5. Export the Business Measures Model & BPEL

___19. Export Business Measures Model and BPEL

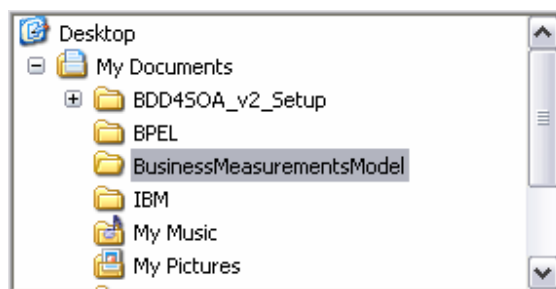
- ___a. Right-click on any **white space** in the Project Tree and select **Export**.



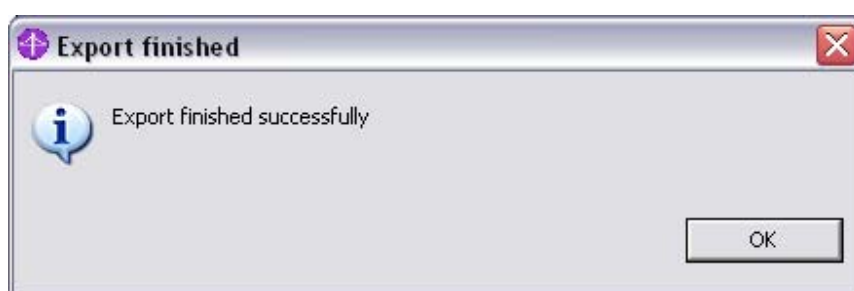
- ___b. Select **WebSphere Business Monitor Development Toolkit (.mm)** in the WebSphere Business Modeler Export dialog. Click **Next**.



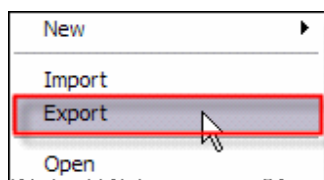
- ___c. Click the **Browse** button next to the Target directory field and click on the **Desktop -> My Documents -> BusinessMeasurementsModel** then click **OK**.



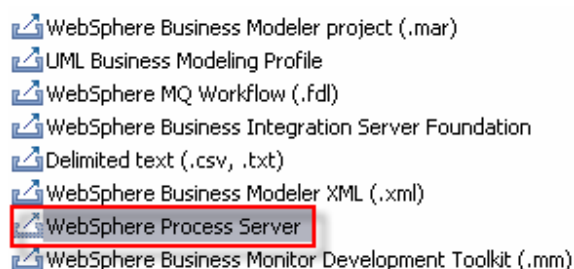
- ___d. Click the **Finish** button.
- ___e. Click the **OK** button in the **Export finished** dialog.



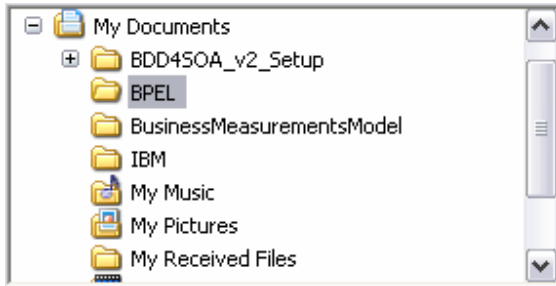
- ___f. Right-click on any **white space** in the Project Tree as second time and select **Export**.



- ___g. Select **WebSphere Process Server** in the WebSphere Business Modeler Export dialog. Click **Next**.



- ___h. Click the **Browse** button next to the Target directory field and click on the **Desktop -> My Documents -> BPEL** then click **OK**.



- ___i. Click **Export Entire Project** to export the entire Account Opening project.
- ___j. Click the **Finish** button.
- ___k. Click the **OK** button in the **Export finished** dialog.

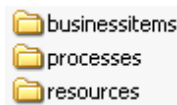


___20. Explore the Exported Files

- ___a. Navigate to the **My Documents** using Windows Explorer by clicking the **Windows Explorer** shortcut on the Quick Launch toolbar.




- ___b. Click on the **BPEL** folder to review its contents



Note: The WebSphere Process Server folder contains a BPEL file for each one of our processes (As-Is, To-Be and To-Be-UNFINISHED), as well as corresponding WSDL files and a Businessitems.xsd file with our business items.

- ___c. Click on the **BusinessMeasurementsModel** folder to review its contents

 _Account_Verification__x0028_As-Is_x0029__Business_Measures_KM_Account_Verification__x0028_As-Is_x0029__KC.svg
 _Account_Verification__x0028_As-Is_x0029__Business_Measures_MDM_Account_Verification__x0028_As-Is_x0029__MC.svg
 _Account_Verification__x0028_To-Be_x0029__-_UNFINISHED_Business_Measures_KM_Account_Verification__x0028_To-Be_x0029__...
 _Account_Verification__x0028_To-Be_x0029__-_UNFINISHED_Business_Measures_MDM_Account_Verification__x0028_To-Be_x0029__...
 _Account_Verification__x0028_To-Be_x0029__Business_Measures_KM_Account_Verification__x0028_To-Be_x0029__KC.svg
 _Account_Verification__x0028_To-Be_x0029__Business_Measures_MDM_Account_Verification__x0028_To-Be_x0029__MC.svg
 Account_Verification_(As-Is)_Business_Measures.mm
 Account_Verification_(To-Be)_-_UNFINISHED_Business_Measures.mm
 Account_Verification_(To-Be)_Business_Measures.mm



Note: These files can be used as input to the WebSphere Business Monitor.

___d. Close **WebSphere Business Modeler** and **Windows Explorer**.

Congratulations! You have successfully completed Lab 1

Lab 2. Process Implementation

Module Introduction

You will recall that in previous modules, a Business Analyst created the Account Verification process and exported it from WebSphere Business Modeler v6.0.

In this module, using WebSphere Integration Developer, the Integration Specialist will implement and test the Account Verification process and use the Determine Applicant Eligibility EJB as an implementation of the Determine Applicant Eligibility component.

Module Overview

- **4.1:** Examine the Components Exported to WebSphere Integration Developer from WebSphere Business Modeler
- **4.2:** Create Originating Human Task for Process Launching
- **4.3:** Configure the Human Tasks to Use Custom JSPs
- **4.4:** Implement the “Credit Risk Assessment” Business Rules Group Component
- **4.5:** Implement the “Determine Applicant Eligibility” Interface as a Web Service
- **4.6:** Test the Process



Important: *If you encounter problems during the course of this exercise, please contact the class instructor or any of the module assistants.*

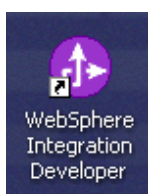


Note: *This module is intended to be completed in 30 minutes.*

2.1. Examine the Components Exported to WID from WBM

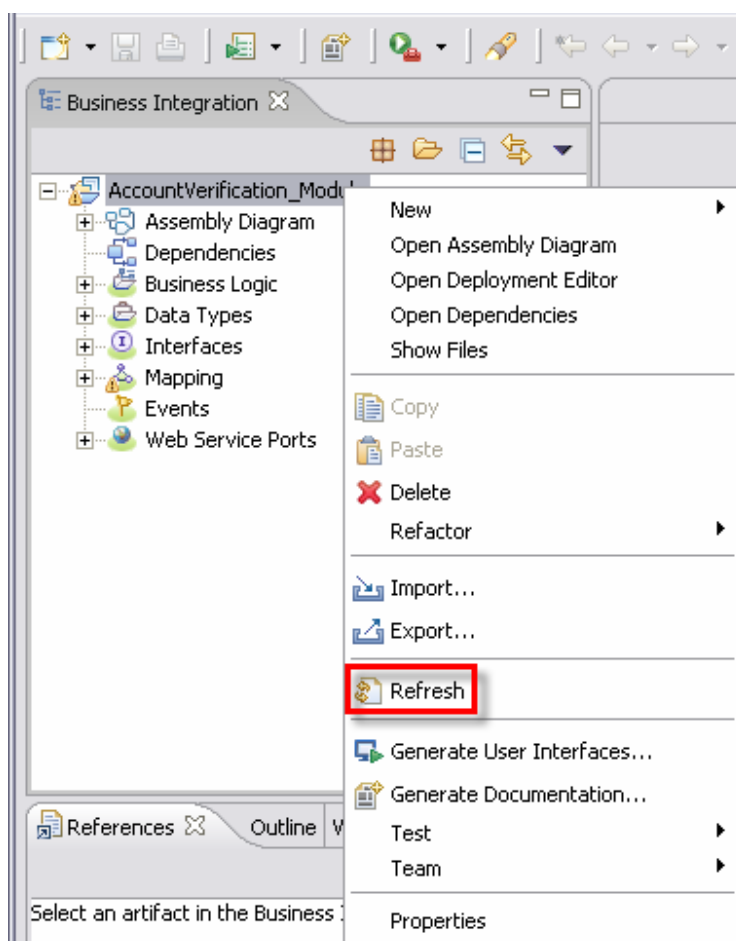
___21. Start WebSphere Integration Developer and Refresh the AccountVerification Workspace

___a. Double click on the **WebSphere Integration Developer** shortcut on the desktop.

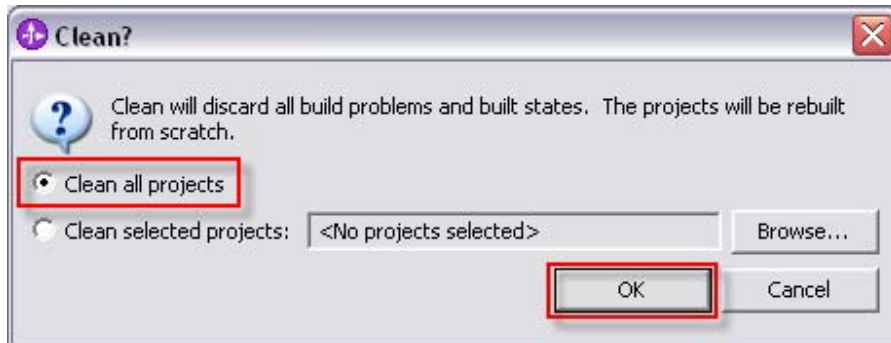



The **WebSphere Integration Developer** appears showing the **Business Integration** perspective.

___b. From the navigation tree in the **Business Integration** view, right-click on the first or topmost **AccountVerification_Module**, and select **Refresh** from the popup menu.



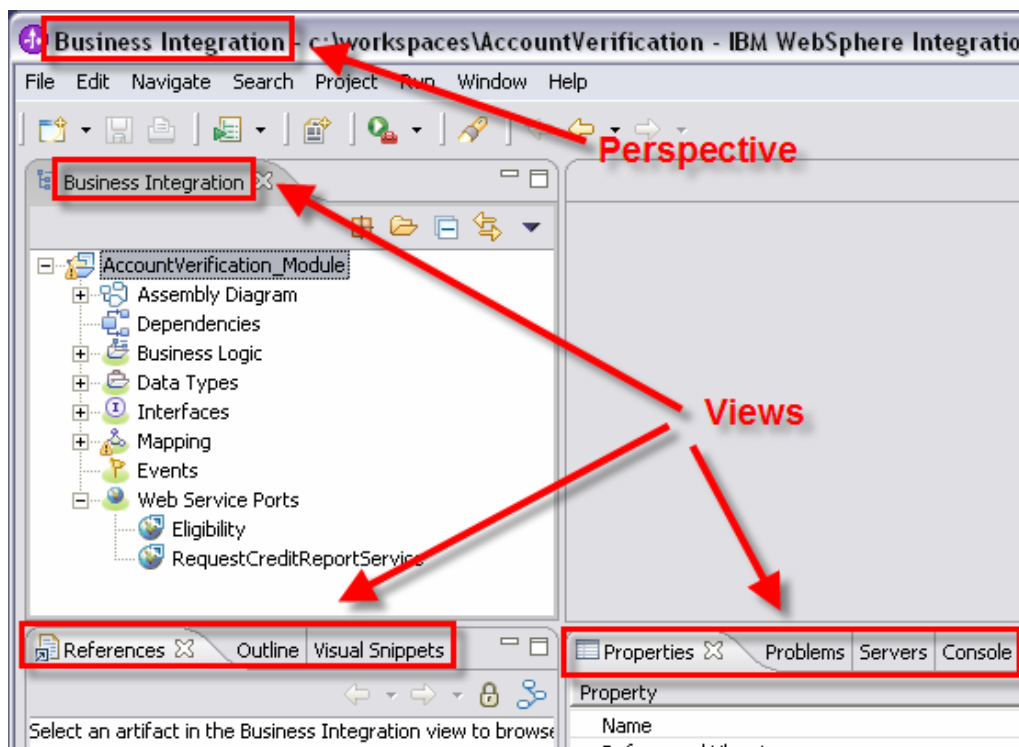
- c. From the main menu, select **Project -> Clean**. From the **Clean?** dialog, accept the default and click **OK**. If an error appears, dismiss the window by clicking **OK**.



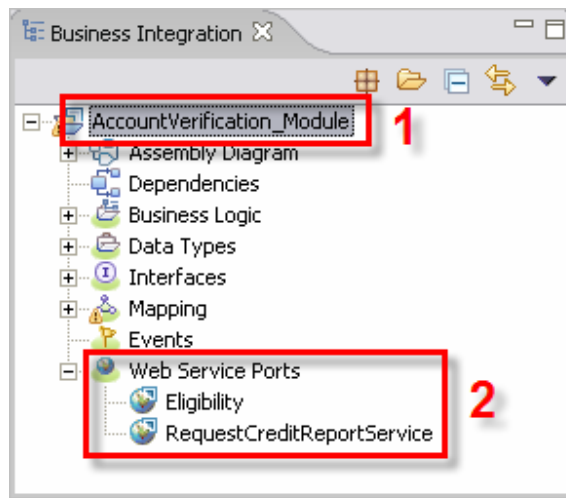
 In an effort to save time, several components of the application you will be developing have already been pre-built. Other components were imported from the WebSphere Business Modeler. The previous steps were performed in order to ensure that the workspace of the WebSphere Integration Developer is in synch with the file system. These steps would typically not be required if developing the application from scratch.

22. Explore the Development Environment and Project Components

In general, a perspective is a collection of views intended for specific development roles. In this case, The **Business Integration** perspective is geared towards the Integration Developer role.



___a. Expand Web Service Ports.



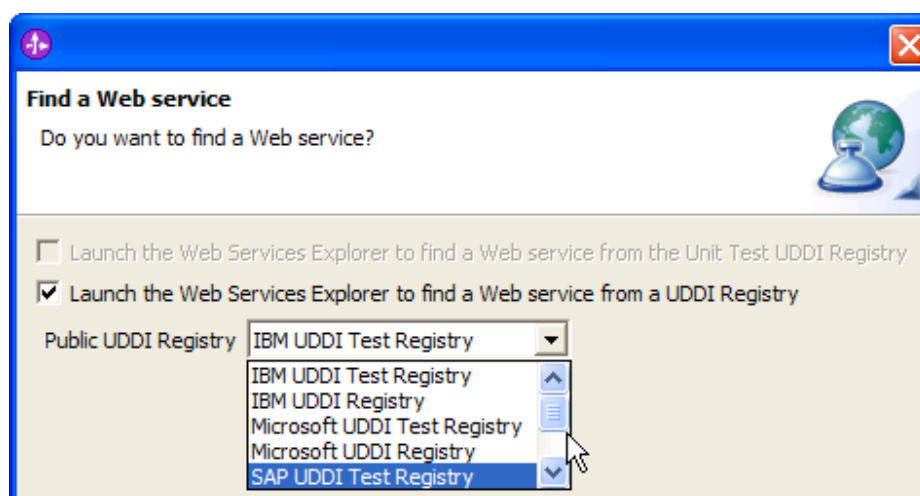
1. Notice the AccountVerification_Module. This is the top folder for the Account Verification project.



2. Notice the two Web Services available. The RequestCreditReportService Web Service is used as the implementation of the "Request Credit Report" task in the process. This implementation has already been done for you. You will use the Eligibility Web Service to implement the "Determine Applicant Eligibility" task in the process. The Eligibility Web Service was previously developed using Rational Software Architect and Rational Application Developer.

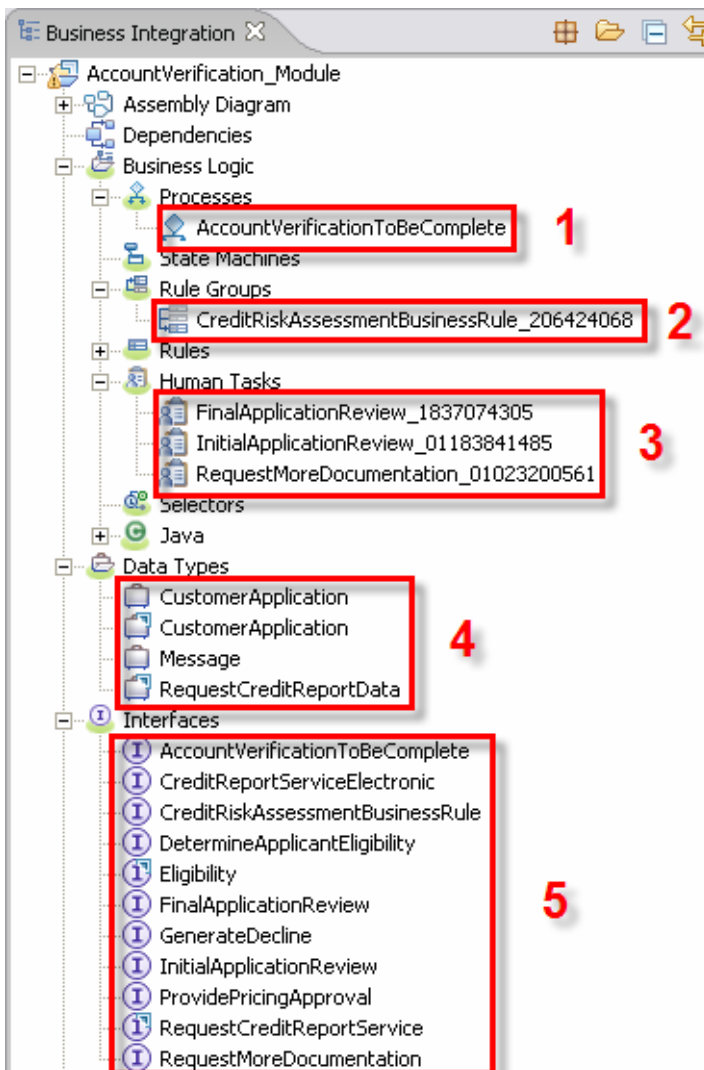


The Web Services were already imported into the workspace for you, including the Eligibility Web Service. Typically you would use the Web Service Import wizard to connect to UDDI Registries and locate Web Services, but this step has already been performed for you.



___b. In the **AccountVerification_Module** navigation tree expand all + buttons (⊕)

Explore the files in the tree view. Most of these files were generated when the process was exported from WebSphere Business Modeler as BPEL. These files are associated with the activities invoked from the Account Verification Process. The Business Integration view should look similar to this:



Note, the artifacts that are not highlighted were pre-built for you.

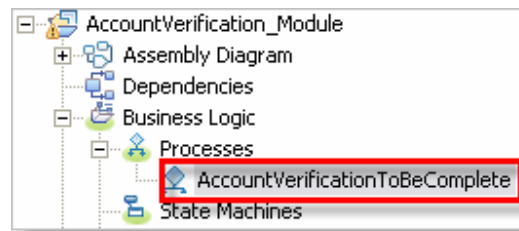
The highlighted artifacts were generated by the WebSphere Business Modeler export:

1. Account Verification *Component* implemented as a BPEL Process.
2. Credit Risk *Component* implemented as a Business Rule Group *Component*.
3. Final Application Review, Initial Application Review and Request More Documentation components implemented as Human Tasks *Components*.
4. The *Business Objects* that represent the input and the output message for the Account Verification process. The 1st CustomerApplication Business Object is used in the BPEL process. The 2nd CustomerApplication Business Object is associated to the imported Eligibility Web Service.
5. The *Interface* for the AccountVerificationToBeComplete BPEL Component.
6. The *Interfaces* for the Components that the Account Verification process invokes.

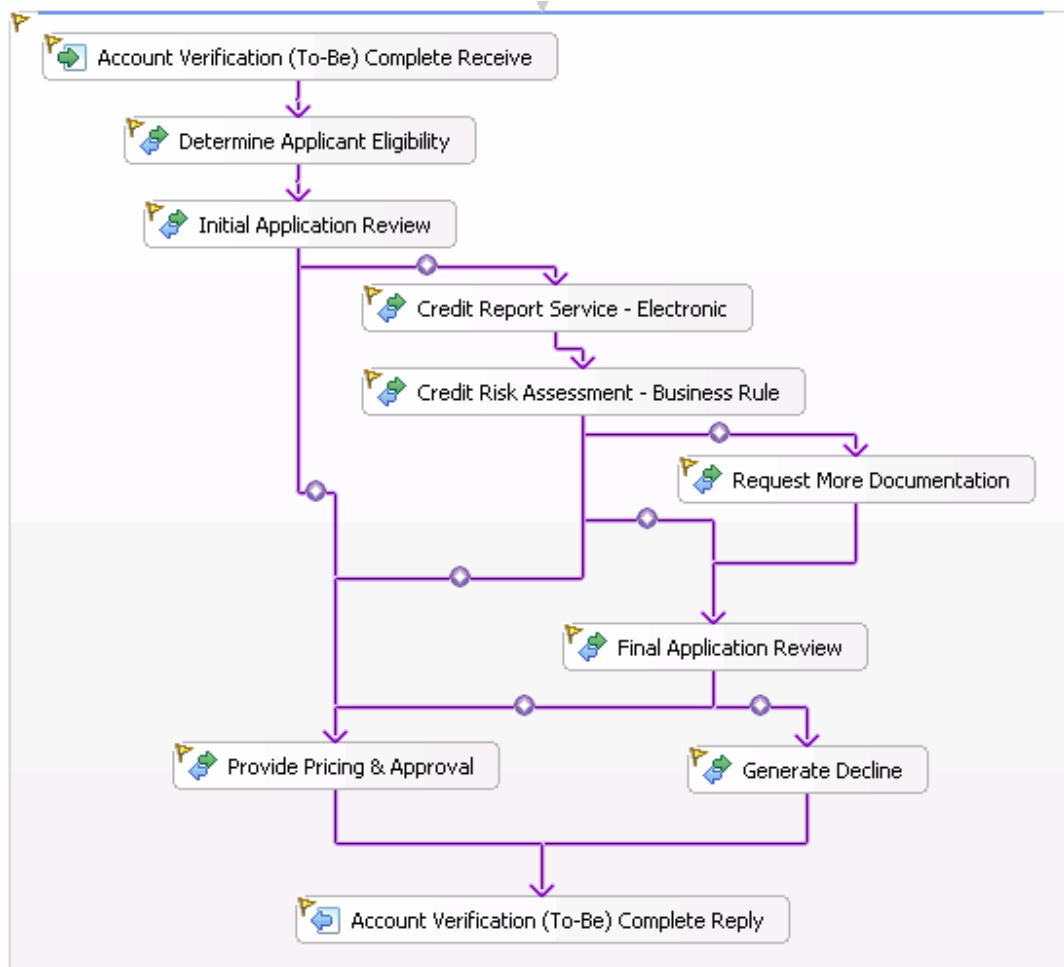
___23. Examine the AccountVerificationToBeComplete BPEL Process Component

You will now use the BPEL Editor to examine one of the interfaces files.

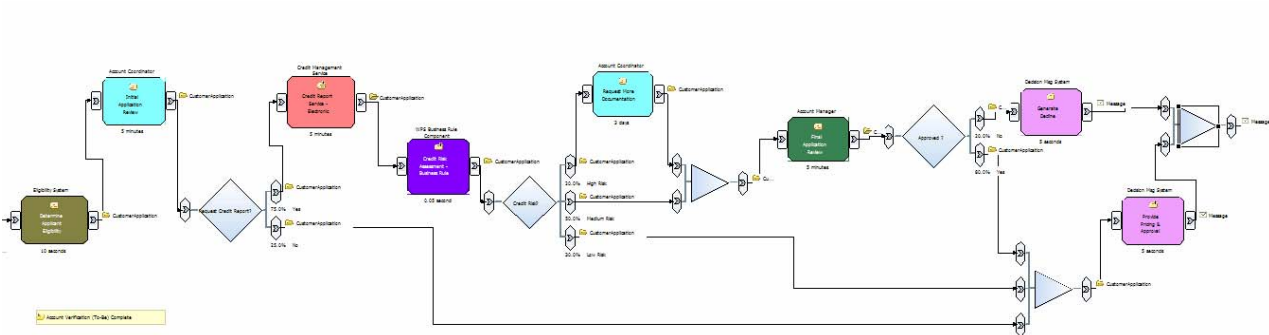
___a. From the navigation tree in the Business Integration view, double-click **AccountVerification_Module -> Business Logic -> Processes -> AccountVerificationToBeComplete**.



The BPEL Editor opens with the AccountVerificationToBeComplete process.



- ___b. Compare the Account Verification process defined in WebSphere Business Modeler (shown below) with the BPEL process in WebSphere Integration Developer.



___c. Examine the BPEL process artifacts.

Account Verification (To-Be) Comp...	
Interface Partners	1
AccountVerificationToBeCompletePartner	
Reference Partners	2
DetermineApplicantEligibilityPartner	
InitialApplicationReviewPartner	
CreditReportServiceElectronicPartner	
CreditRiskAssessmentBusinessRulePartner	
RequestMoreDocumentationPartner	
FinalApplicationReviewPartner	
GenerateDeclinePartner	
ProvidePricingApprovalPartner	
Variables	3
CustomerApplicationVariable	
MessageVariable	
Correlation Sets	

1. Interface Partners

This section defines how the process is invoked. Specifically it references the AccountVerificationToBeComplete interface.

2. Referenced Partners

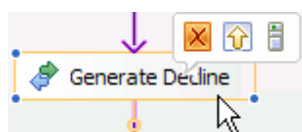
This section defines the interfaces that may be used to invoke the activities defined in the process. For example, in the BPEL process, the Generate Decline activity uses the GenerateDeclinePartner partner reference. This partner reference is defined using the GenerateDecline interface.

3. Variables

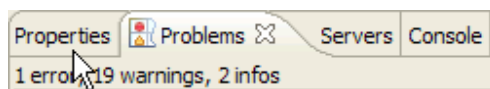
The Account Verification process uses two BPEL variables: CustomerApplicationVariable for input and MessageVariable for output. These BPEL variables are defined in terms of the Business Objects shown in the Business Integration view.

Let's examine how one of the BPEL activities was configured.

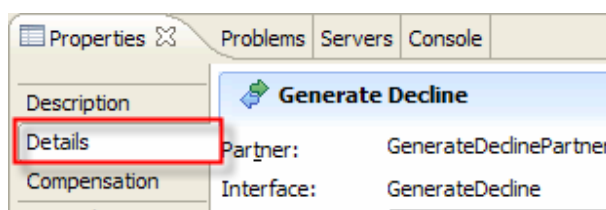
___d. Select the **Generate Decline** activity.



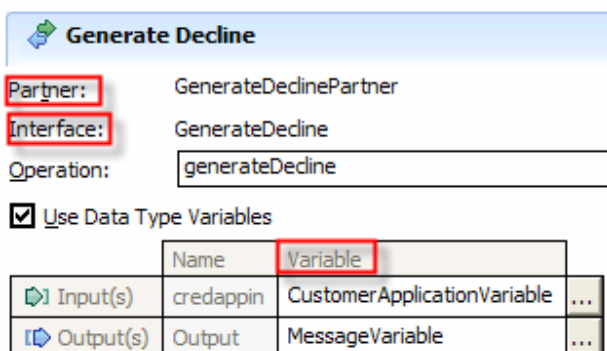
___e. In the view below the Process Editor, click the **Properties** tab to switch to the Properties view.



___f. In the **Properties** view (below the BPEL editor window) click the **Details** tab.



___g. Examine the details for the Generate Decline activity.



Partner

Note the Partner GenerateDeclinePartner Recall that it is defined in the Referenced Partners section.

Interface

This is the GenerateDecline interface. It is defined in the Business Integration view.

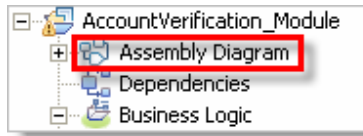
Variable

Note the names of the BPEL input and output variables. The Generate Decline activity uses CustomerAccplicationVariable for input and MessageVariable for output.

___24. Examine the Assembly Diagram

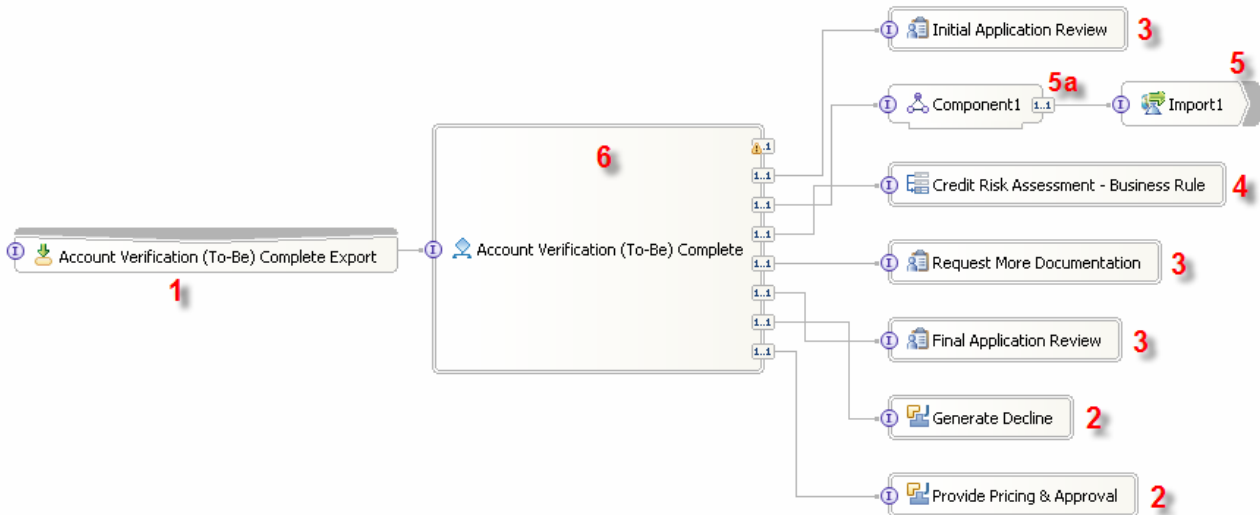
When you opened the Account Verification process with the Process editor you saw the activities that the process invokes arranged in an acyclic directed graph. The process editor allows us to configure and connect the activities but it does not allow us to specify the component types or bindings. In short the process editor creates abstract processes. To make a process concrete that is invocable we need to specify the component types and bindings. This is the role of the Assembly Diagram Editor.

___a. From the navigation tree in the Business Integration view, double-click **AccountVerification_Module -> Assembly Diagram**.



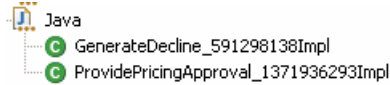
The Assembly Diagram Editor opens with the AccountVerification_Module module.

b. Examine the contents of the Assembly Diagram Editor.



1. SCA Export allows the Account Verification process to be 'visible'. As a result it may be invoked from other modules or from J2EE applications

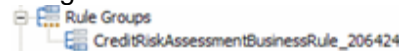
2. Two Components are implemented as Java Components. Recall that their implementations can be seen in the Business Integration view.



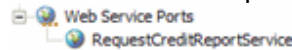
3. Three Components are implemented as Human Tasks. Recall that their implementations can be seen in the Business Integration view.



4. One Component is implemented as a Business Rule Group. Recall that its implementation can be seen in the Business Integration view.



5. One activity in the Process Component is wired to the imported RequestCreditReportService Web Service. In the Business Integration view, this is the Web Service that we imported into the workbench.



5a. Interface Map Component to map the RequestCreditReportService Web Service to its corresponding activity in the Process Component.

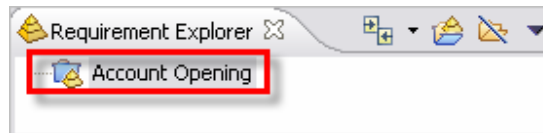
6. The Account Verification BPEL process was rendered as a Process Component. Note that the Process component references all the other components.

___25. Trace Assembly Diagram to Business Use Case

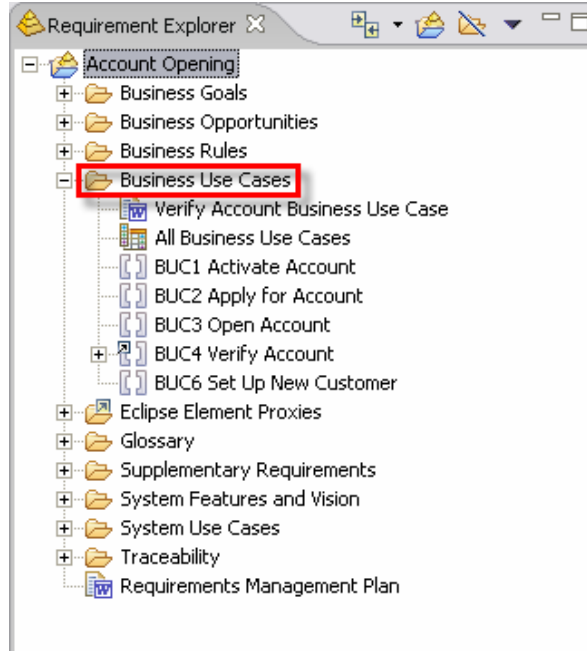
- ___a. Change to the Requirements perspective by clicking the **Open Perspective** button then selecting **Requirement**.



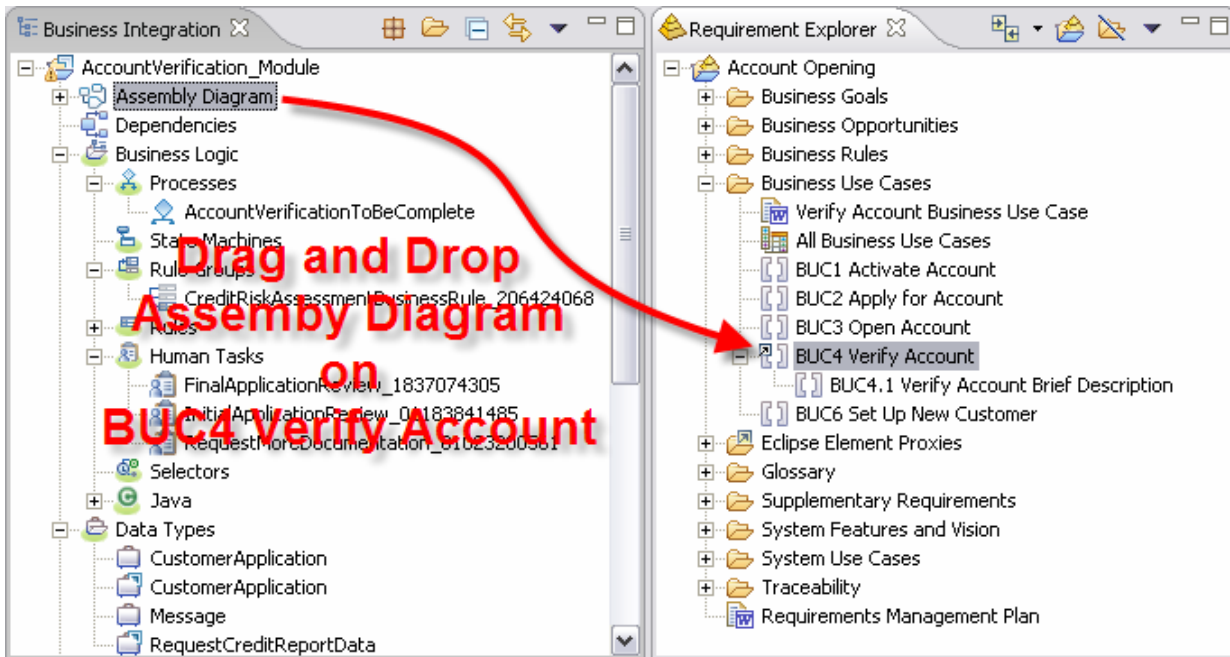
- ___b. Double-click on **Account Opening** in the Requirement Explorer to open the RequisitePro project. Select the **Unknown** user when asked for Project logon.



- ___c. **Click the + symbol** to view the **Account Opening** project contents
- ___d. **Click the + symbol next to Business Use Cases** to view all business use cases within the project

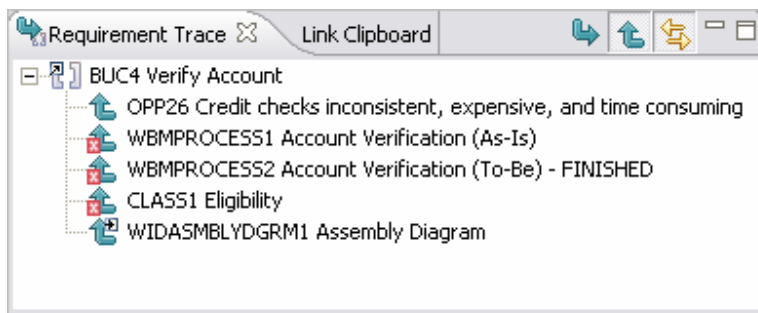


- ___e. **Drag-and-drop the Assembly Diagram** from the Business Integration view onto **BUC4 Verify Account** in the Requirement Explorer.

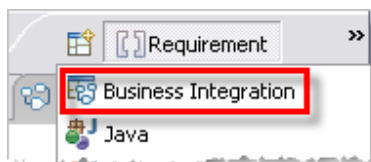


This action links the Assembly Diagram in WID with the business use case BUC4 in RequisitePro allowing traceability from requirements to implementation.

- ___f. **Left-click** once on **BUC4 Verify Account** in the **Requirement** perspective
- ___g. Note in the **Requirement Trace** view that the business use case traces to both the As-Is and To-Be models in WBM and the Assembly Diagram in WID.



- ___h. Return to the **Business Integration** perspective to configure human tasks.



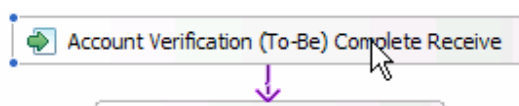
2.2. Configure Human Tasks

The Account Verification process will involve two types of Human Tasks. The first type is an Originating Human Task which will be used for starting the Account Verification process. This type of human task allows you to control who may start a process or communicate with a running process by specifying who is authorized to start the process. An Originating Task also allows us to specify the user interface to provide input to the process (either a JSP or a Portlet). Rather than creating a new Human Task Component, an Inline Human Task will be created which is only visible to the process in which it is included.

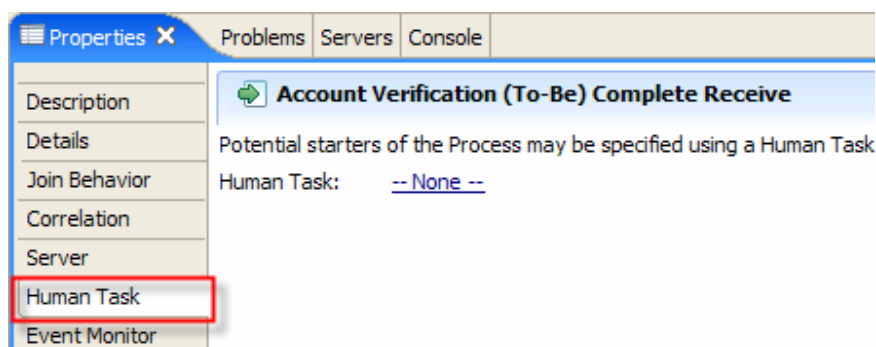
___1. Create the Inline Human Task

___a. Switch to the Process Editor for **AccountVerificationToBeComplete** process.

___b. In the process editor select the **Account Verification (To-Be) Complete Receive** activity.



___c. In the Properties view (below the BPEL editor window) click the **Human Task** tab.

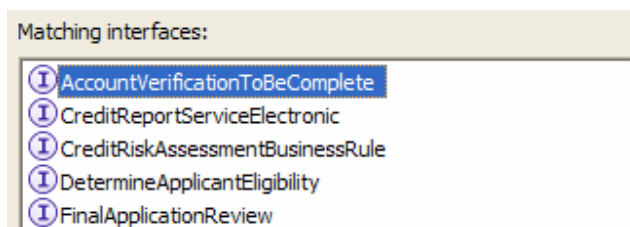


Notice that no Human Task for starting the process has been defined.

___d. On the Properties page, click the **New...** button to create a new Originating Task.

The Interface Selection window opens.

___e. In the Interface Selection window, select the **AccountVerificationToBeComplete** interface.

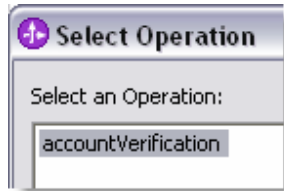


Recall that this is the interface that defines the AccountVerification process.

___ f. Click the **OK** button.

The Human Task editor opens for AccountVerificationToBeCompleteTask1 Human Task.

___ g. Select the **accountVerification** operation

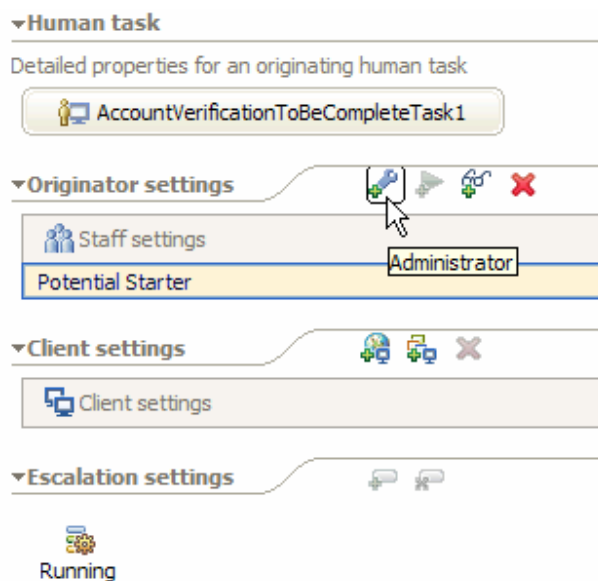


___ h. Click **OK**

___ 2. Configure the Human Task

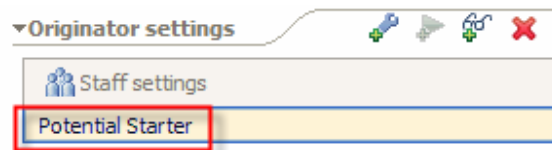
___ a. Move the cursor over the buttons in the **Originator settings** section. **Do not click.**

Note that you can define Administrator, Potential Starter and Reader roles.

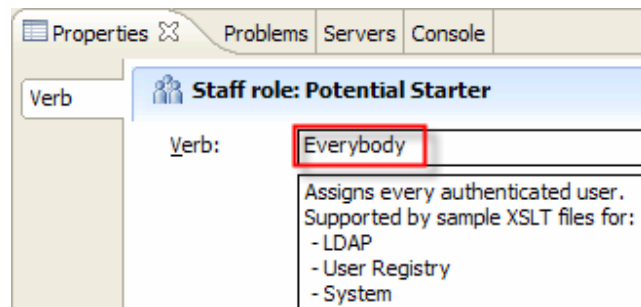


Also note that the Potential Starter role has been already defined.

___ b. Click the **Potential Starter** role.



___c. Examine the contents of the **Properties** window below the Human Task editor.



Note that by default, the “Verb” is set to “Everybody”. The verb defines the query against a Staff Repository. A Staff Repository holds the information about the organization structure of an enterprise. Out of the box, WebSphere Process Server can plug into three types of Staff Repositories: (i) Lightweight Directory Access Protocol (LDAP), (ii) Local operating system user registry, and (iii) WebSphere Application Server user registry. You will now configure the user interface settings for this Originating Task.

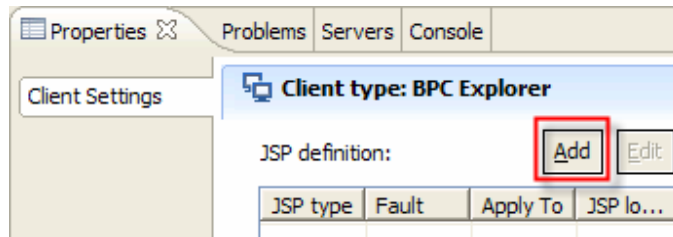
___d. Move the cursor over the buttons in the **Client settings** section.

Note that you can define BPC Explore and Portal Client for user interface targets.



___e. Click the **BPC Explorer** button.

___f. In the **Properties** window below the Human Task editor, click the **Add** button.



The JSP Definition window appears.

___g. In the JSP Definition window select the following:

<u>ATTRIBUTE</u>	<u>SETTING</u>
JSP type	Input message JSP
Apply to	All

You will now specify the JSP that defines the user interface for starting the process.

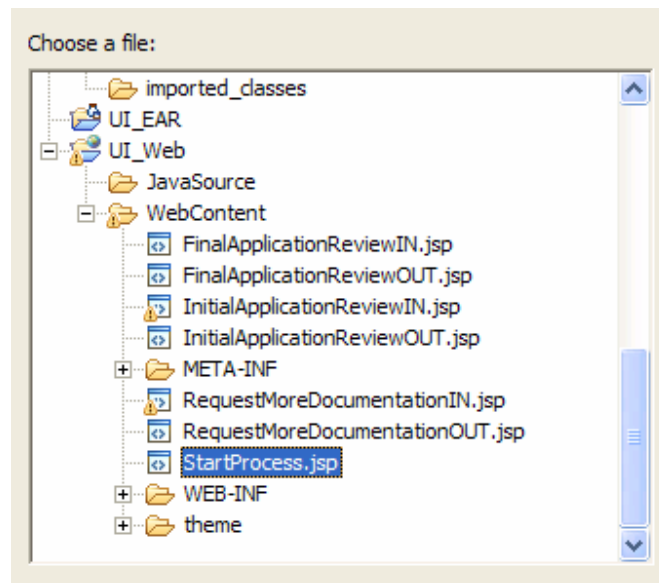


Typically you would need to develop this JSP using the JSP editor. In this module all of the JSPs have been developed for you. The JSPs are packaged in a separate WAR file called UI_Web.

___h. To select the **JSP location**, click the **Browse...** button.

The Select a JSP window appears.

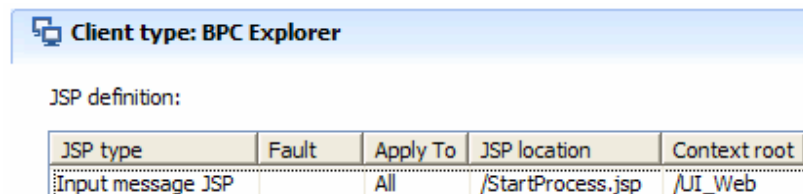
___i. In the Select a JSP window, navigate to **UI_Web -> WebContent** and select **StartProcess.jsp**.



___j. Click the **OK** button.

___k. On the JSP Definition window click the **OK** button.

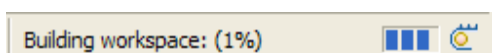
The Properties page for the BPC Explorer should look similar to this. Note, you may need to resize the columns to see the full contents.



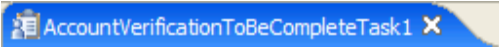
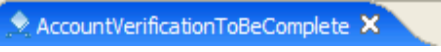
___l. Press **Ctrl-s** to save.

Note: In this workspace, the **Build Automatically** option is turned on. Whenever you change and then save a file, WebSphere Integration Developer will rebuild your project.

This might cause the progress indicator in the lower right corner to become active.

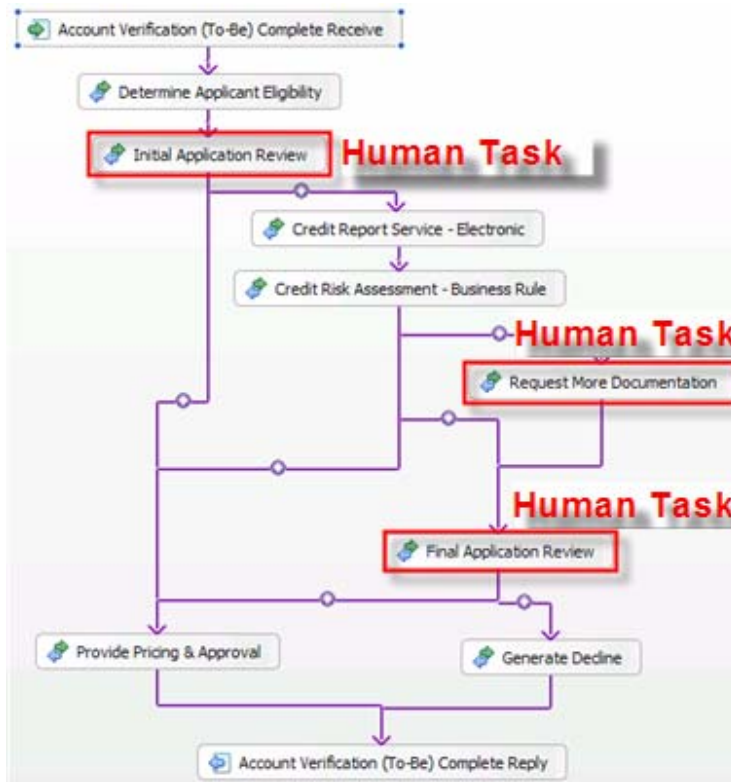


Whenever this progress indicator appears, wait until it disappears before proceeding.

- ___m. Click the **X** button  to close the Human Task Editor.
- ___n. On the **Process Editor**, Press **Ctrl-s** to save.
- ___o. Click the **X** button  to close the Process Editor.

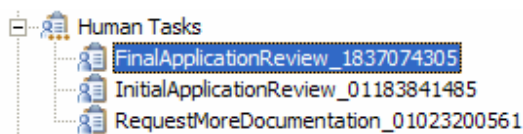
2.3. Configure the Human Tasks to Use Custom JSPs

Recall that in WebSphere Business Modeler you defined three tasks to have a Human Task implementation. As part of the export to WebSphere Process Server, WebSphere Business Modeler created three Human Task components in the Account Verification process.



In this part, we will configure the **Final Application Review** Human Task to use a custom JSP for input and output. The other two Human Tasks, **Initial Application Review** and **Request More Documentation**, have already been configured for you.

- ___1. Configure Final Application Review Human Task
 - ___a. From the navigation tree in the Business Integration view, double-click **AccountVerification_Module -> Business Logic -> Human Tasks -> FinalApplicationReview_1837074305**.

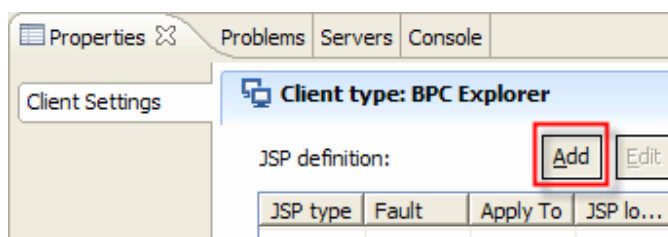


The Business Object Editor opens with the Human Task.

- ___b. Move the cursor over the buttons in the **Client settings** section and click the **BPC Explorer** button.



- ___c. In the **Properties** window below the Human Task editor, click the **Add** button.



The JSP Definition window appears.

- ___d. In the JSP Definition window select the following:

<u>ATTRIBUTE</u>	<u>SETTING</u>
JSP type	Input message JSP
Apply to	All

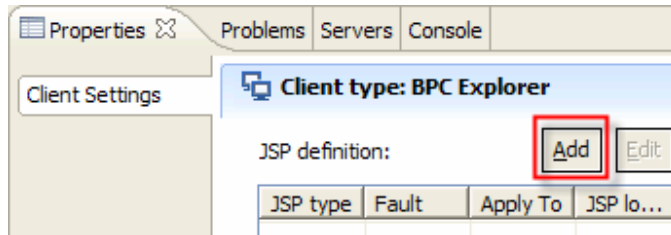
You will now specify the JSP that defines the user interface for this Human Task.

- ___e. To select the **JSP location**, click the **Browse...** button.

The **Select a JSP** window appears.

- ___f. In the Select a JSP window, navigate to **UI_Web -> WebContent** and select **FinalApplicationReviewIN.jsp**. (Be sure to select the JSP ending with **...IN.jsp**)

- ___g. Click the **OK** button.
- ___h. On the JSP Definition window click the **OK** button.
- ___i. In the **Properties** window below the Human Task editor, click the **Add** button again.



The JSP Definition window appears.

- ___j. In the JSP Definition window select the following:

<u>ATTRIBUTE</u>	<u>SETTING</u>
JSP type	Output message JSP
Apply to	All

You will now specify the JSP that defines the user interface for this Human Task.

- ___k. To select the **JSP location**, click the **Browse...** button.

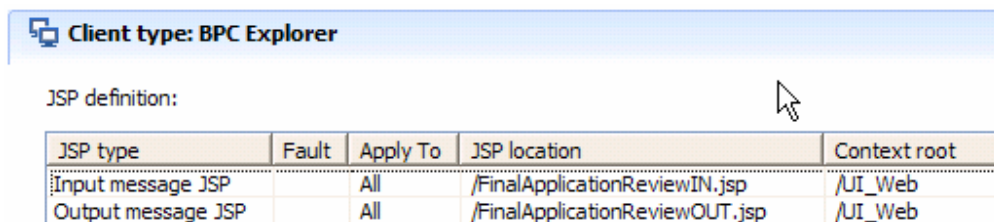
The Select a JSP window appears.

- ___l. In the Select a JSP window, navigate to **UI_Web -> WebContent** and select **FinalApplicationReviewOUT.jsp**. (Be sure to select the JSP ending with **...OUT.jsp**)

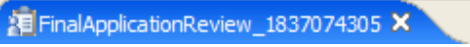
- ___m. Click the **OK** button.

- ___n. On the JSP Definition window click the **OK** button.

The Properties window for the BPC Explorer should now look similar to this:



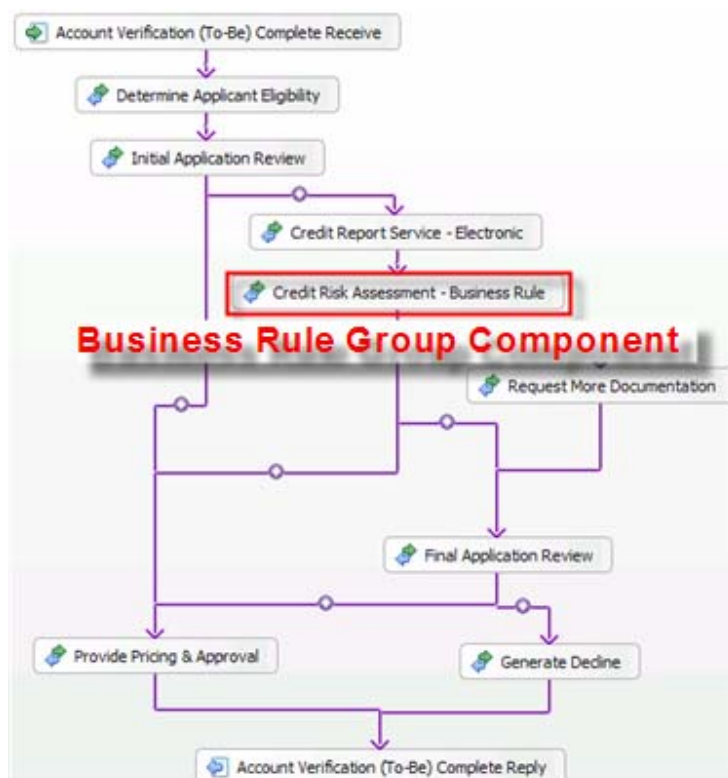
___o. Press **Ctrl-s** to save.

___p. Click the **X** button  to close the Human Task Editor.

2.4. Implement “Credit Risk Assessment” Business Rules Group Component

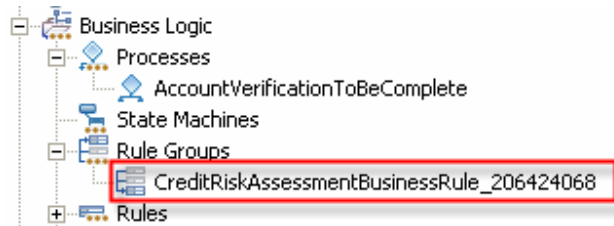
Recall that in WebSphere Business Modeler you defined one task to have a Business Rule Group implementation. As part of the export to WebSphere Process Server, WebSphere Business Modeler created a Business Rule Group component.

In this section we will use a visual editor to complete the implementation the Business Rule Group component. The Business Rule component has already been created for you, as well as 2 of the 3 action rules for determining the credit score. The action rules for the two credit scores “HIGH” and “MED” have already been previously defined. You will create the action rule for the credit score “LOW” to complete the implementation of this business rule component.



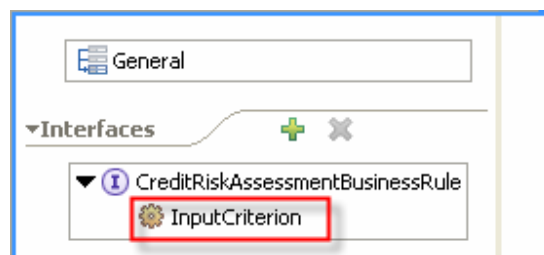
___1. Configure the Business Rule Group Component

___a. From the navigation tree in the Business Integration view, double-click **AccountVerification_Module -> Business Logic -> Rule Groups -> CreditRiskAssessmentBusinessRule_206424068**.

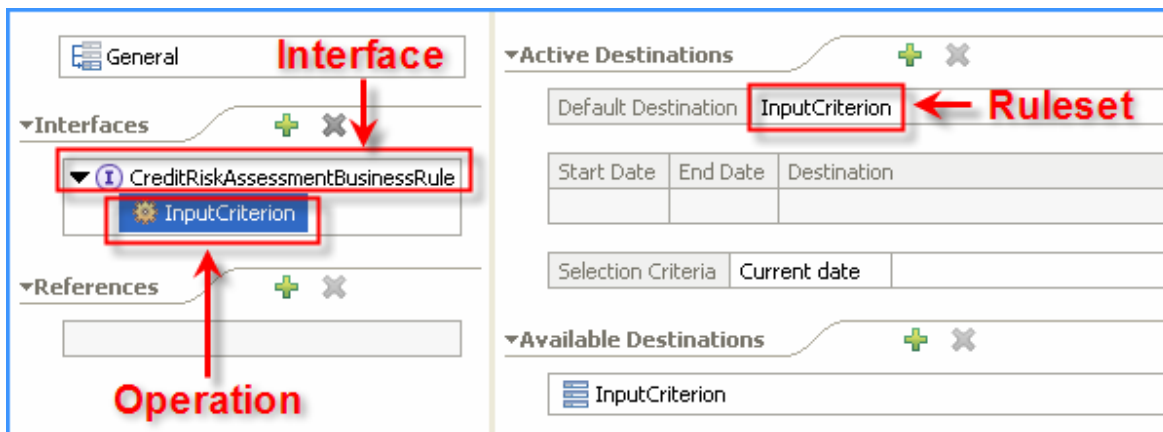


The Rule Group editor opens with the Credit Risk Assessment Rule Group component.

___b. In the Interfaces section, click the **InputCriterion** operation.

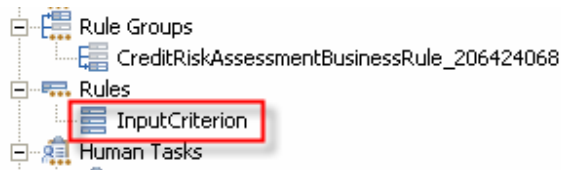


___c. The right pane is where you typically define a new Ruleset for this Business Rule component. However, a Ruleset also named **InputCriterion** has already been created for you to save time.



___2. Open the pre-built Rule Set

___a. From the navigation tree in the Business Integration view, double-click **AccountVerification_Module -> Business Logic -> Rules -> InputCriterion**.




___ b. The Ruleset Editor appears. Scroll down to the **Templates** section. Notice that we've already defined a Template named **Template 1** for you to save time. This is the template used to create the rules in the section above.

Name	Rule2
Template	Template 1
Presentation	IF customer credit score is greater than <input type="text" value="330"/> but less than <input type="text" value="589"/> then credit risk is <input type="text" value="HIGH"/>

Name	Rule3
Template	Template 1
Presentation	IF customer credit score is greater than <input type="text" value="590"/> but less than <input type="text" value="749"/> then credit risk is <input type="text" value="MED"/>

▼Templates

Name	Template 1		
Presentation	IF customer credit score is greater than <input type="text" value="{param1}"/> but less than <input type="text" value="{param2}"/> then credit risk is <input type="text" value="{param3}"/>		
Parameters	Name	Type	Constraint
	param1	int	None
	param2	int	None
If	all of the following are true		
	<ul style="list-style-type: none"> • Input.creditScore > param1 • Input.creditScore < param2 		
Then	Output.creditRisk = param3		

 Using a special web application (*Business Rules Manager*) the thresholds (*param1*, *param2* and *param3*) may be changed dynamically without redeploying the Business Rule Group component.

___ c. Scroll to the **Rules** section. Notice that we've already defined a default **Action Rule** for you.

▼Rules

Name	Rule1
Presentation	
Action	Output = Input Output.creditRisk = "HIGH"

___3. Create Rule Based on Rule Template

Three rules are needed to map the credit score obtained from the “Request Credit Report” Web Service to a credit risk rating of “LOW”, “MED” and “HIGH”. The **Action Rules** for the “HIGH” and “MED” credit risk ratings have already been defined for you. You will now create the third **Action Rule** for the “LOW” credit risk rating.

___a. In the **Rules** section, click the **Add Template Rule** button and select **Template1**




___b. In the Presentation section entry area for Rule4, enter:

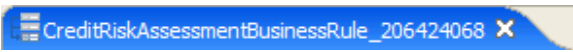
<u>ATTRIBUTE</u>	<u>SETTING</u>
1st Enter Value	750
2nd Enter Value	830
3rd ^t Enter Value	LOW

The rules should now look similar to this:

Name	Rule2
Template	Template 1
Presentation	IF customer credit score is greater than <input type="text" value="330"/> but less than <input type="text" value="589"/> then credit risk is <input type="text" value="HIGH"/>
Name	Rule3
Template	Template 1
Presentation	IF customer credit score is greater than <input type="text" value="590"/> but less than <input type="text" value="749"/> then credit risk is <input type="text" value="MED"/>
Name	Rule4
Template	Template 1
Presentation	IF customer credit score is greater than <input type="text" value="750"/> but less than <input type="text" value="830"/> then credit risk is <input type="text" value="LOW"/>

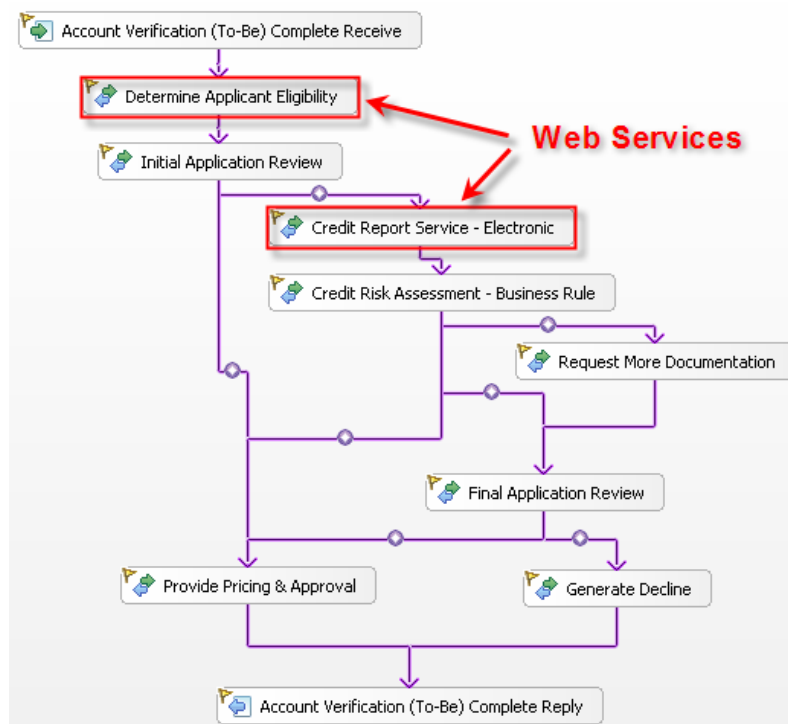
___c. Press **Ctrl-s** to save.

___d. Click the **X** button  to close the Ruleset Editor.

___e. Click the **X** button  to close the Rule Group Editor.

2.5. Implement the “Request Credit Report” Interface as a Web Service

Recall that in WebSphere Business Modeler you defined tasks with no specific implementation. As a result, when the process was exported, components with no component types were created. We will use Web Services to implement those tasks.



To save time, we’ve already implemented the **Credit Report Service – Electronic** task to use the **RequestCreditReportService** Web Service.

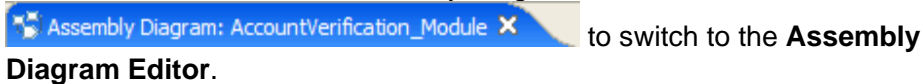
In this section, you will use an SCA Import to make the existing **Eligibility** Web Service available to the Account Verification process.

Our design point is to maintain the contract between the **AccountVerification** process and the **Eligibility** Web Service. In other words, we cannot change the interface or the data types used in the process to invoke the **Eligibility** Web Service. This poses a problem. The Web Service we have selected does not support the interface that the process uses. In order to solve this problem, we will use an interface map component and data maps. The interface map component will map the interface required by the process to the interface offered by the Web Service, and the data maps will map the input/output data between the process and the Web Services.

This is a good example of bottom up development. So far we have been using the top-down approach: we have been generating implementation rather than reusing it.

___ 1. Wire the Web Service to the Process via the Interface Map Component

___ a. In the main view, click the Assembly Diagram Editor tab



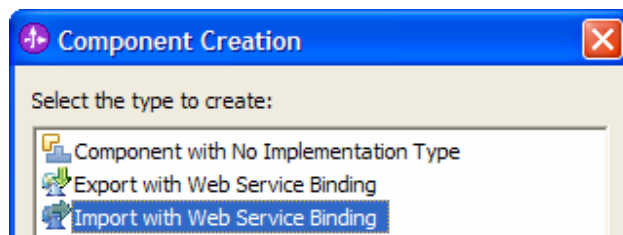
___ b. From the navigation tree in the Business Integration view, select **Web Service Ports > Eligibility**.



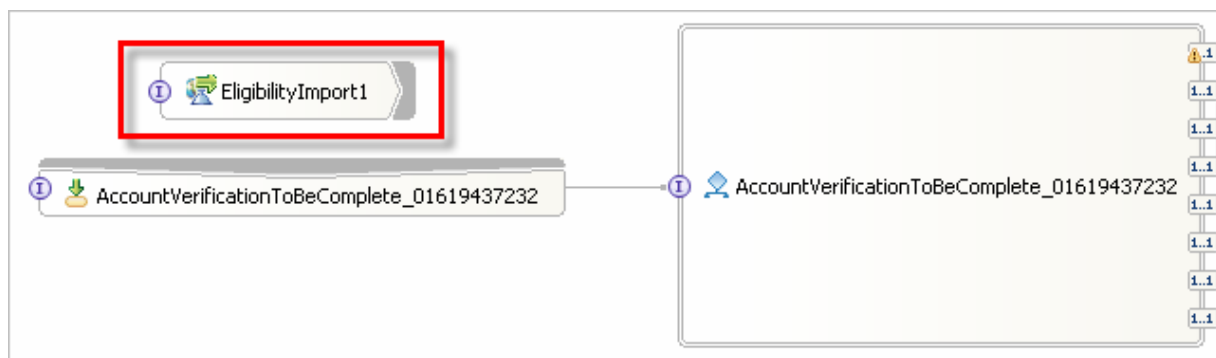
Drag it and drop it on the Assembly Diagram Editor.

The Component Creation window appears.

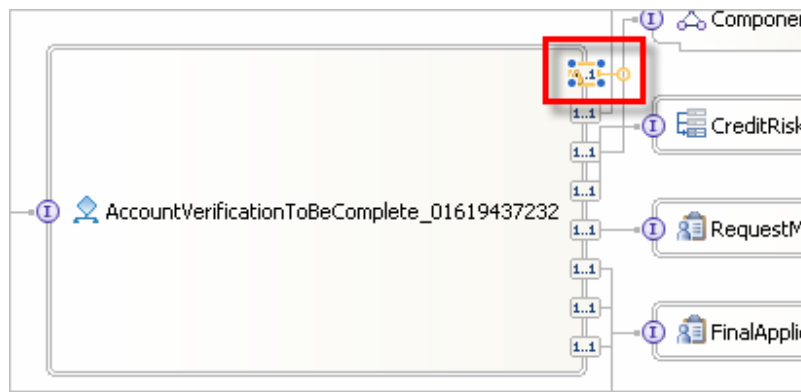
___ c. In the Component Creation window, select **Import with Web Service Binding** and click the **OK** button.



The Web Service SCA Import appears.

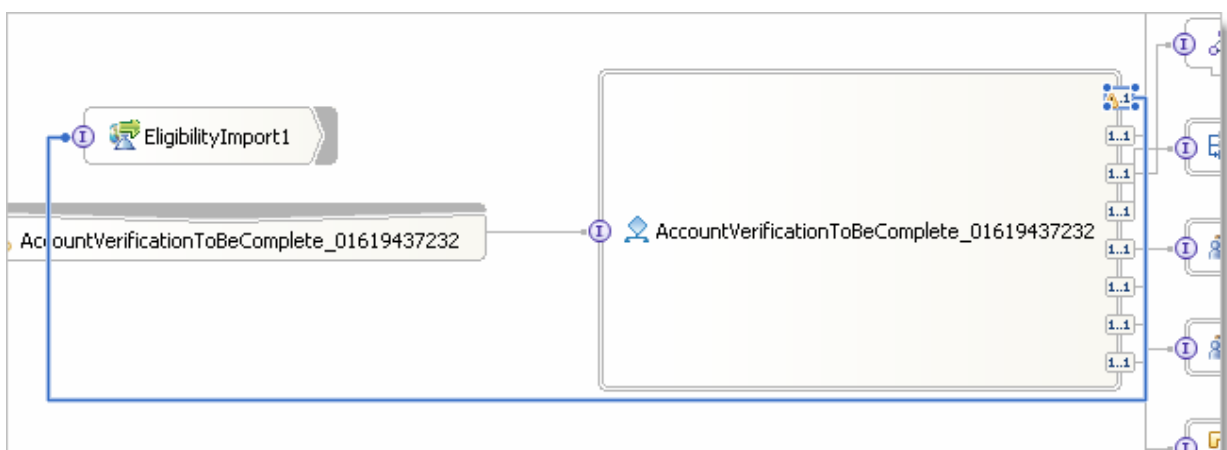


___ d. On the Account Verification (To-Be) Complete component, position the cursor on top of the **un-wired reference** until a yellow circle appears.

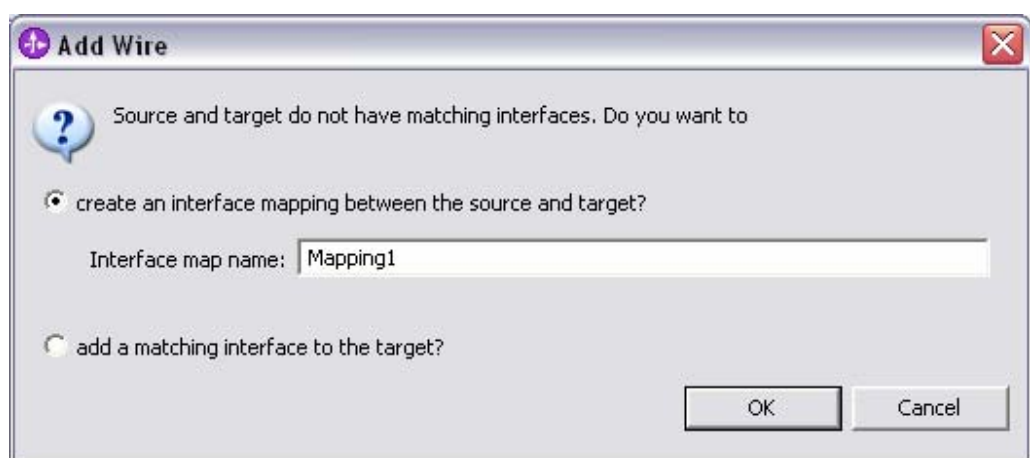


This is the reference to the **DetermineApplicantEligibility** task in the process.

- ___e. Select the **yellow circle** and **hold the left mouse button**.
- ___f. While holding the left mouse button, move the cursor to the **EligibilityImport1** component to form a blue connecting line, then release.



- ___g. The Add Wire window appears. Rename to **Mapping1**.

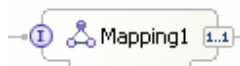


- ___h. On the Add Wire window, click the **OK** button to create an interface map between the **Determine Applicant Eligibility** task in the process and the **Eligibility Web Service**.
- ___i. Right-click in the whitespace of the diagram and select **Arrange Contents Automatically**

An Interface Map component named **Mapping1** is connected between the Process component and the **EligibilityImport1** component (Eligibility Web Service).

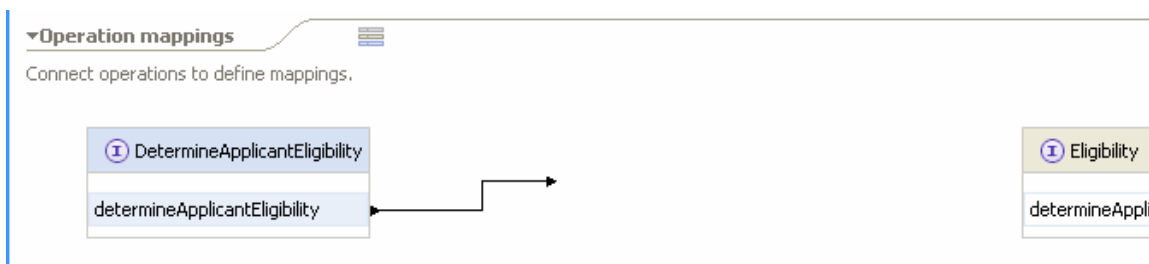


- ___2. Implement the Interface Map Component
 - ___a. In the **Assembly Diagram Editor**, double-click the **Mapping1** component.



The Interface Mapping Editor appears.

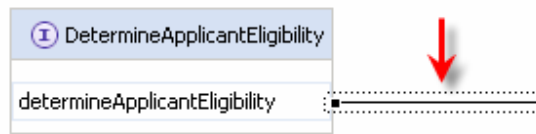
- ___b. Select the operation on the left (**determineApplicantEligibility**), press the left mouse button and **start dragging** the cursor towards the operation on the right.



- ___c. Connect the two operations by releasing the cursor on the **determineApplicantEligibility** operation on the right.

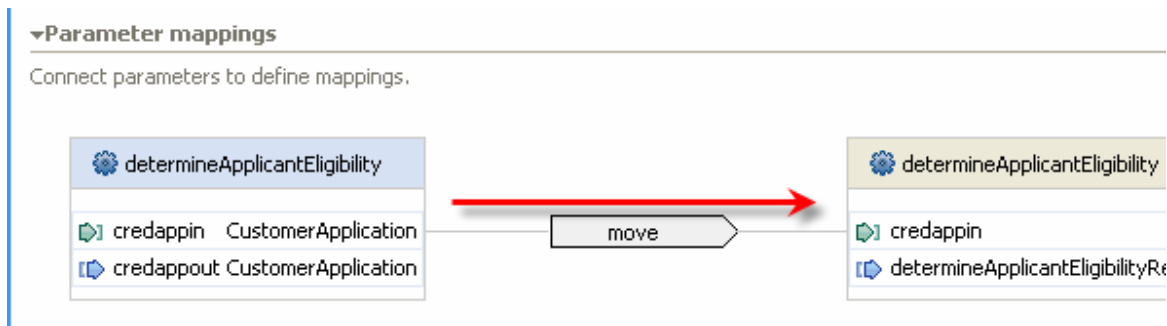


___d. Click the **connection** between the operations.

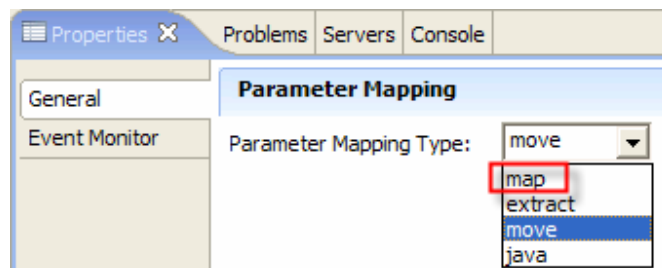


The Parameter mappings pane appears below.

___e. In the Parameter mappings pane, connect the **credappin CustomerApplication** business object on the left to the **credappin CustomerApplication** on the right.

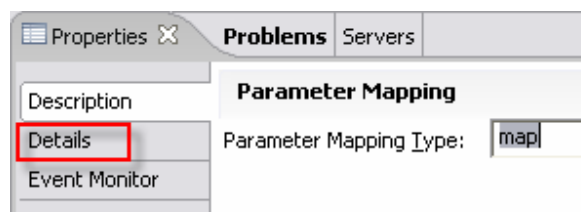


___f. From the **Properties** window below, select **map** for the **Parameter Mapping Type**.

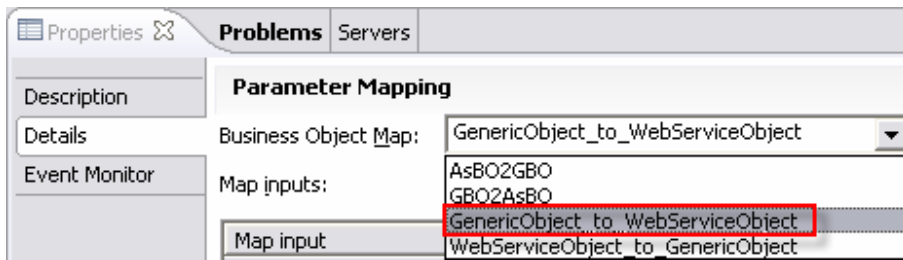


We will now use a pre-built Data Map to map the Business Object used in our process to the Business object used in the Web Service. Later, in Section 4, you will learn how these Data Maps were created for you.

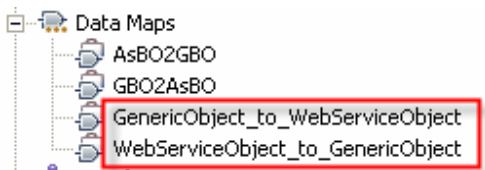
___g. In the Properties window select the **Details** tab.



___h. For the Business Object Map, select **GenericObject_to_WebServiceObject**.

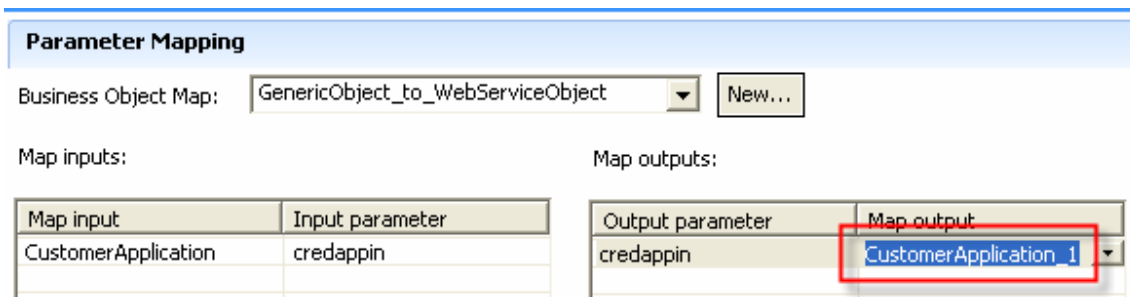


Note: Two Business Object Maps have already been created for you. You can find them in the Business Integration view:



After you complete this section we will examine the how the data maps were constructed.

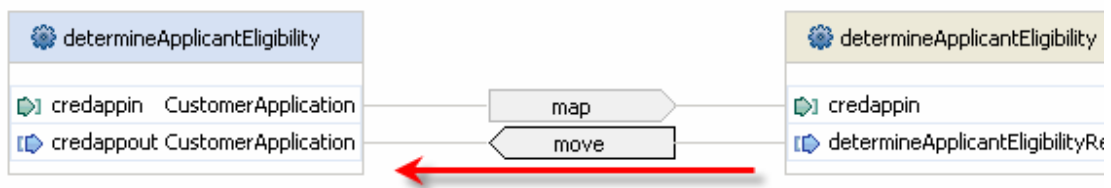
- ___i. For the **Map output**, select **CustomerApplication_1** from the dropdown list. It may already be selected.



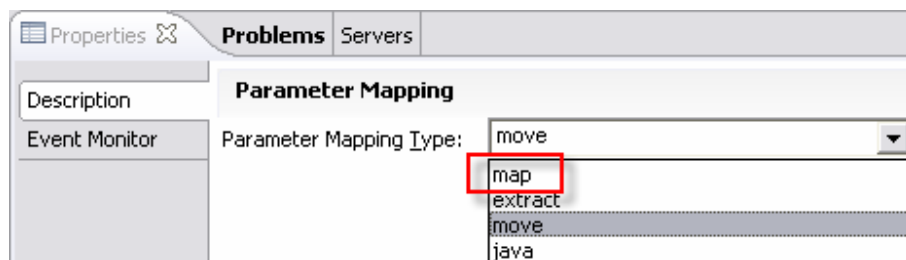
- ___j. Inside the Interface Map Editor, connect the **credappin CustomerApplication** business object on the right to the **credappin CustomerApplication** on the left.



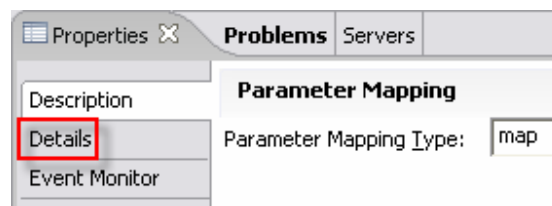
Hint: Use the same steps (drag and drop method) as when connecting operations in steps c-d.



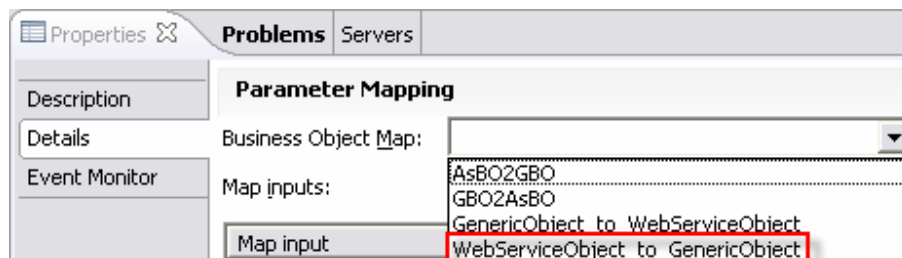
___k. From the **Properties** window below select **map** for the **Parameter Mapping Type**.



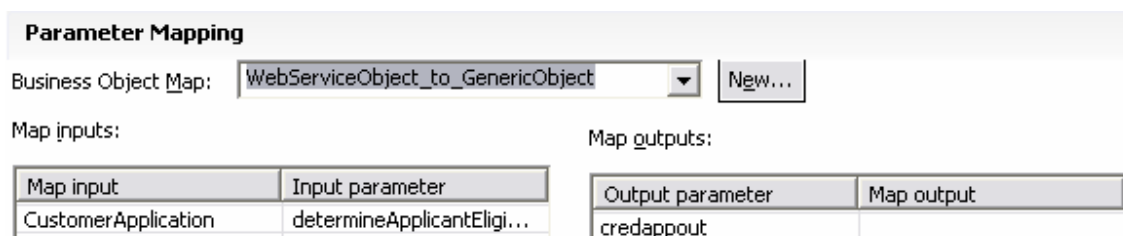
___l. In the Properties window select the **Details** tab.



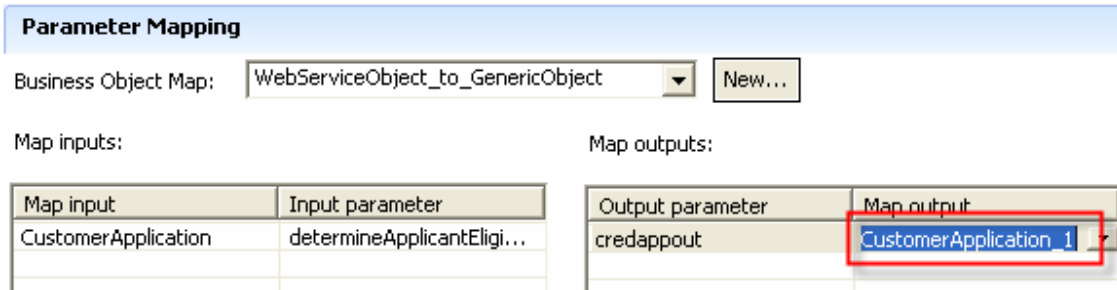
___m. For Business Object Map, select **WebServiceObject_to_GenericObject**.



At this point the parameter mapping page should look similar to this:

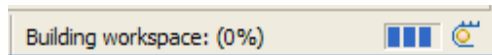


___n. For the **Map output**, select **CustomerApplication_1** from the dropdown list. It may already be selected.

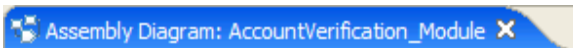


- ___o. Press **Ctrl-s** to save.
- ___p. Click the **X** button next to **Mapping1** to close the Interface Map Editor.
- ___q. With the focus on the **Assembly Diagram** Editor, press **Ctrl-s** to save.

The progress indicator in the lower right corner becomes active.



Wait until the progress indicator disappears.

Click the **X** button  to close the Assembly Diagram Editor.

___3. Examine How the Business Object Maps Were Constructed

Recall that in the previous steps we needed an interface map component to resolve the impedance mismatch between an interface originally designed in WebSphere Business Modeler and the Web Service interface we decided to use. The interfaces we needed to transform used different data types. The Interface Map component uses Business Object Maps to map the attributes of these different data types.

The Business Object Maps were pre-built for you. Let's examine how they were constructed.

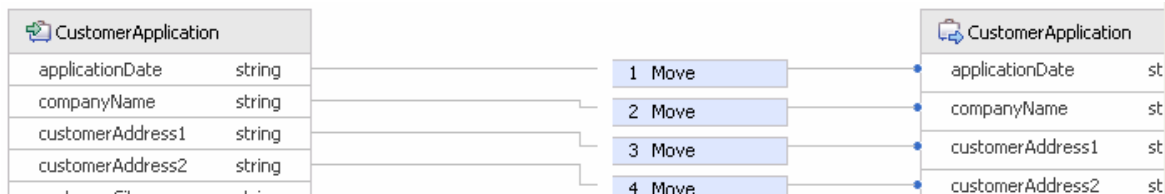
- ___a. From the navigation tree in the Business Integration view, double-click **AccountVerification_Module -> Mapping -> Data Maps -> GenericObject_to_WebServiceObject**.


The Business Object (BO) Map Editor opens with the Customer Application object.

- ___b. Examine the contents of the BO Map Editor.

Notice that it maps the CustomerApplication BO (used by the Account Verification process) to the CustomerApplication BO (used by the Web Service).

Typically the objects would contain different data that would require more complex mappings. For the purpose of this module we used a simple “Move” mapping strategy.



- ___c. Click the **X** button  to close the BO Map editor.

If you have made any changes, do not save them. Press the **NO** button on the Save Resource window to dismiss changes and close the BO Map Editor.

2.6. [OPTIONAL] Test the Process

As we were working on the implementation detail of the Account Verification process, WebSphere Integration Developer incrementally kept building the J2EE artifacts. We are now ready to test the process. For this purpose WebSphere Integration Developer was configured out of the box with a fully functioning WebSphere Process Server. Before we can start testing all we need to do is to point WebSphere Process Server to the J2EE artifacts that WebSphere Integration Developer has generated for us. Once we do that we will be ready to test.

In this section we will test two paths through the process: the simple one and the most complex one.

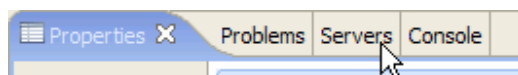
To test the process you will be using Business Process Choreography (BPC) Explorer. BPC is a web client that communicates with a user in a runtime environment. It allows the user to launch a process and interact with the Human Task components that are defined in the process.



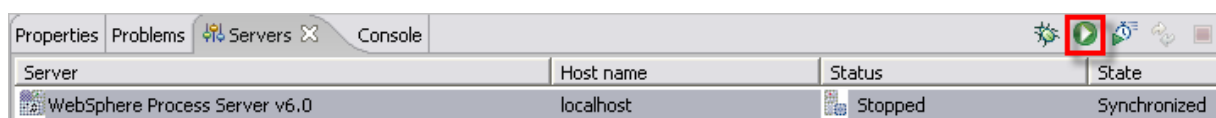
Note: BPC Explorer is intended as a testing/problem determination and administrative tool for managing your WebSphere Process Server solutions.

___1. Start the WebSphere Process Server

- ___a. In the view located in the lower right corner, click the **Servers** tab to switch to the Servers view.

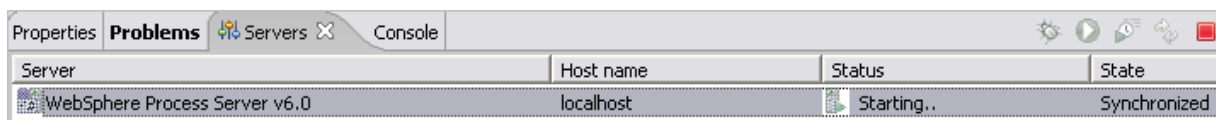


- ___b. Select the WebSphere Process Server v6.0 instance and click the Start the server button.

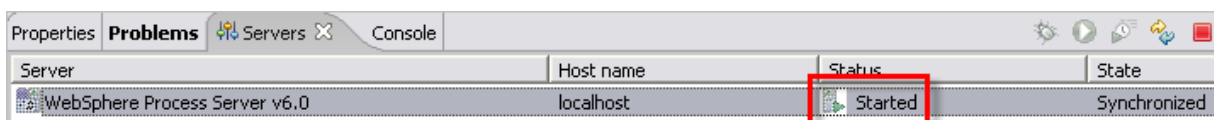


___2. Deploy the Process on WebSphere Process Server

- ___a. In the view located in the lower right corner click the **Servers** tab to switch to the Servers view.



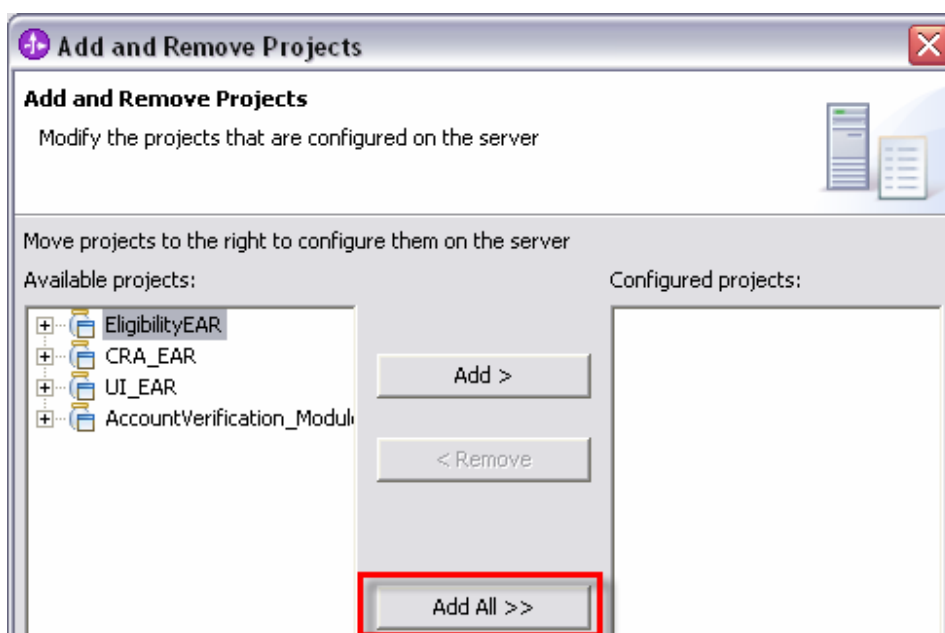
- ___b. Check if the **WebSphere Process Server v6.0** instance has already started.



Wait for the server to start if needed.

- ___c. Select the **WebSphere Process Server v6.0** instance, click the right mouse button and from the pop-up menu select **Add and remove projects...**

The Add and Remove Projects window appears.



- ___d. In the Add and Remove Projects window, click the **Add All >>** button and then click the **Finish** button.

The view changes from Server to Console.

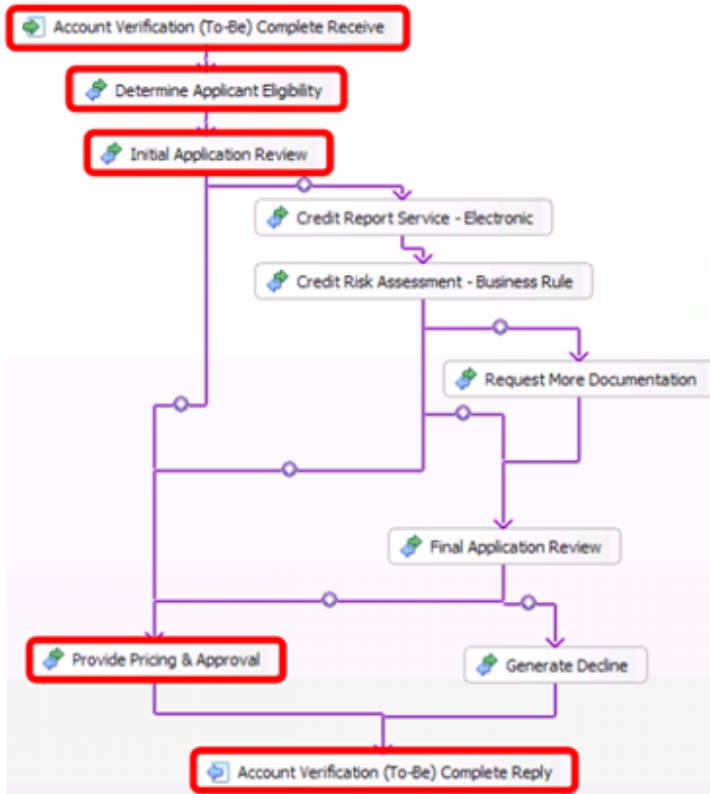
Wait for the server to finish publishing.

Before you proceed to the next step, wait until all activity in the Console view ceases. If the projects published successfully, the Console view should contain messages similar to these:

```
SRVE0169I: Loading Web Module: AccountVerification_ModuleWeb.
SRVE0250I: Web Module AccountVerification_ModuleWeb has been bound to default_host[*:9080,
MSVRO221I: Application started: AccountVerification_ModuleApp
```

You may have to scroll up the Console view to find these messages.

___3. Run the “Simple Path” Test Case



“Simple Path” Test Case

In the “simple” path the application is approved outright.

There are three processing steps in the “Simple” path:

1. Determine Application Eligibility – determines if the customer is eligible and supplies customer details data.

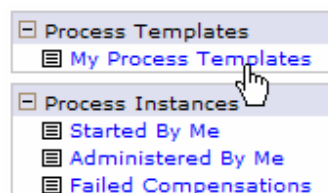
2. Initial Application Review (Human) – based on the data supplied, determines if the customer’s application should be approved outright or requires more approval steps.

3. Provide Pricing & Approval – processes customer application approval.

- ___a. In the view located in the lower right corner click the **Servers** tab to switch to the Servers view.
- ___b. Select the **WebSphere Process Server v6.0** instance, click the right mouse button and from the pop-up menu select **Launch -> Business Process Choreographer Explorer**

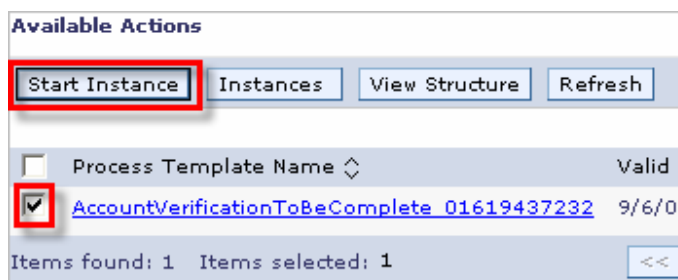
The BPC Explorer (a Web application) is launched and appears in the main view.

- ___c. In the BPC Explorer click the **My Process Templates** link.



In the right pane a list of Process Templates appears.

- ___d. Select the AccountVerificationToBeComplete_01619437232 **check box**, and then click the **Start Instance...** button.



The JSP for starting the process appears.

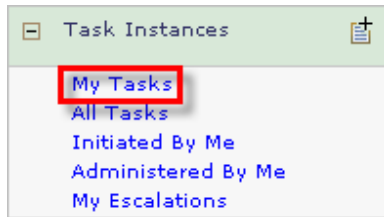
- ___e. In the JSP, make sure that the Company Name is set to **IBM**, and then click the **Submit** button.



Wait for a few moments and then examine the Console view below the BPC Explorer window. You should see in it a message from the Determine Applicant Eligibility component:

```
SystemErr      R Determine Applicant Eligibility - begins...
SystemErr      R Credit report is not needed
SystemErr      R Determine Applicant Eligibility - ...ends
```

- ___f. In the BPC Explorer, click the **My Tasks** link.



In the right pane, you should now see an instance of the Initial Application Review Human Task.

- ___g. Select the **InitialApplicationReview_01183841485** check box and then click the **Work on** button.

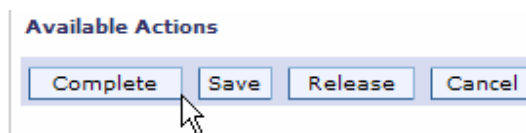


The JSP for providing the input and output for the Human Task appears.

- ___h. In the JSP make sure **not to select** the Credit Report Needed checkbox



- ___i. Click the **Complete** button.

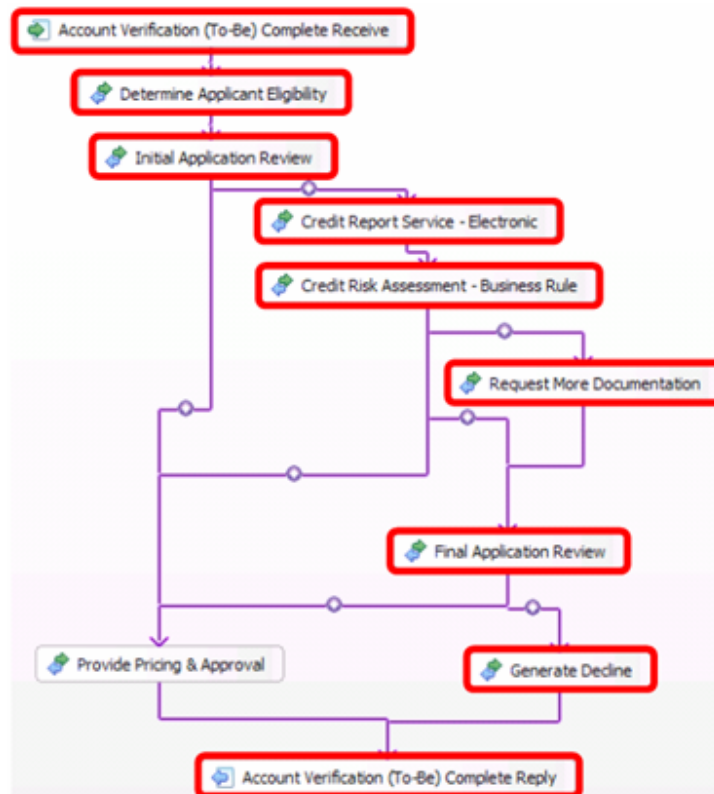


Wait for a few moments and then examine the Console view below the BPC Explorer window. You should see in it a message from the Provide Pricing & Approval component:

```
SystemErr      R [Java] Provide Pricing Approval - begins
SystemErr      R [Java] Provide Pricing Approval - Account verification for customer IBM was successful.
SystemErr      R [Java] Provide Pricing Approval - ends
```

This message indicates that the process successfully completed the “Simple Path” test.

- ___4. Run the “Complete Path” Path Test Case



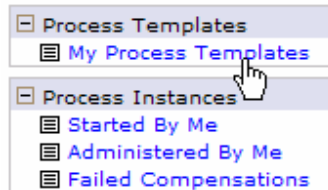
“Complete Path” Test Case

A “Complete Path” is where an application goes through several approval steps and then it is rejected.

There are six processing steps in the “complete path” test case:

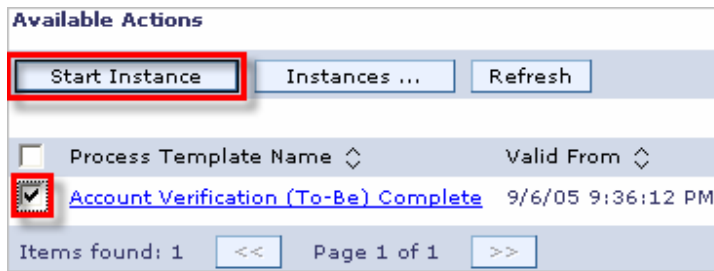
1. Determine Application Eligibility – determines if the customer is eligible and supplies the customer details data.
2. Initial Application Review (Human) – based on the data supplied, determines if the customer’s application should be approved outright or requires more approval steps.
3. Retrieve Credit Report – a Web Service that provides a credit rating. In the case of the customer “ACME” the credit rating returned is 800.
4. Credit Risk Assessment – a Business Rule Group that given the credit rating returns a credit risk value. In the case of the customer ‘ACME the credit risk returned is “HIGH”.
5. Request More Documentation (Human) – provides more or changes some of the customer information. It is only executed if the customer credit risk is “HIGH”.
6. Final Application Review (Human) – based on the data supplied, determines if the customer’s application should be approved or declined.
7. Generate Decline – processes customer verification refusal.

___b. In the BPC Explorer click the **My Process Templates** link.



In the right pane a list of Process Templates appears.

___c. Select the **AccountVerificationToBeComplete_01619437232** check box and then click the Start Instance... button.



The JSP for starting the process appears.

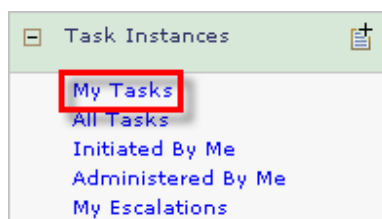
___d. In the JSP, make sure that the Company Name is set to **ACME** and then click the **Submit** button.



Wait for a few moments and then examine the Console view below the BPC Explorer window. You should see in it a message from the Determine Applicant Eligibility component:

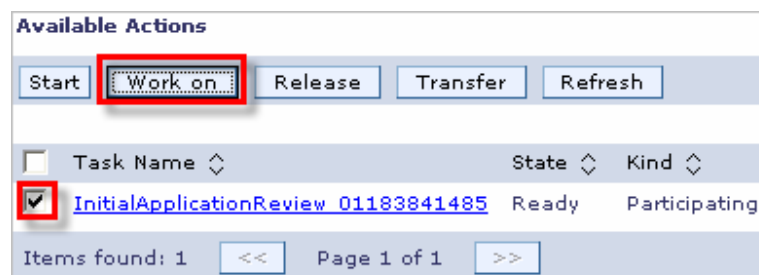
```
SystemErr      R Determine Applicant Eligibility - begins...
SystemErr      R Credit report is needed
SystemErr      R Determine Applicant Eligibility - ...ends
```

___e. In the BPC Explorer, click the **My Tasks** link.



In the right pane, you should now see an instance of the Initial Application Review Human Task.

___f. Select the check box of the last instance (the one in a "Ready" state) of **InitialApplicationReview_01183841485** Human Task instance and then click the **Work on** button.



The JSP for providing the input and output for the Human Task appears.

___g. In the JSP make sure to check the **Credit Report Needed** checkbox.

JK Enterprises

Account Verification Process

Initial Application Review

Application Date	Aug 31, 2005
Company Name	ACME
Customer Address 1	50
Customer Address 2	Vina Blvd.
Customer City	Markham
Customer State	ON
Customer Country	Canada
Customer Postal Code	M3C-3P5
Contact First Name	Paul
Contact Last Name	Pacholski
Contact Phone Number	905-882-7234
Request Account Amount	100000
Credit Score	0
Product Name	Labels
Pricing Code	23
Comments	
Credit Rating	
Pricing Score	
Credit Report Needed	<input checked="" type="checkbox"/>
Credit Risk	
Application Decision	true

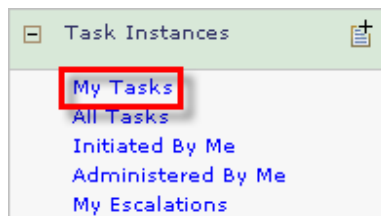
___h. Click the **Complete** button.

Available Actions

Wait for a few moments and then examine the Console view below the BPC Explorer window. You should see in it a message from the Request Credit Report Web Service:

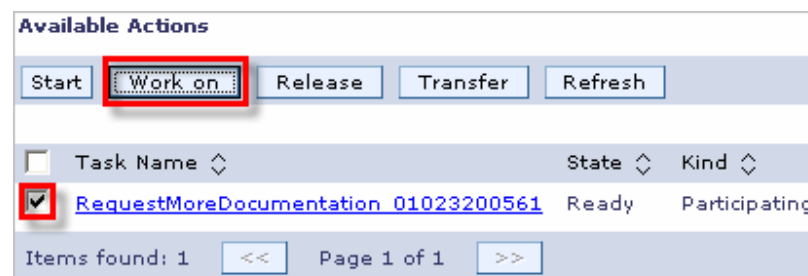

```
WebService: Request Credit Report - begins...
WebService: Request Credit Report - credit score for ACME is 500
WebService: Request Credit Report - ends...
```

___i. In the BPC Explorer, click the **My Tasks** link.



In the right pane, you should now see an instance of the **Request More Documentation** Human Task.

___j. Select check box of the **RequestMoreDocumentation_01023200561** Human Task instance and then click the **Work on** button.



The JSP for providing the input and output for the Human Task appears.

___k. Enter **Reject** in the **Comments** field.



Note: The Request More Documentation Human Task enables you to make changes to the customer application information. Note that most of the entry fields are enabled.

JK Enterprises

Account Verification Process

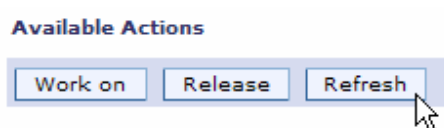
Request More Documentation

Application Date	Sep 1, 2005
Company Name	ACME
Customer Address 1	50
Customer Address 2	Vina Blvd.
Customer City	Markham
Customer State	ON
Customer Country	Canada
Customer Postal Code	M3C-3P5
Contact First Name	Paul
Contact Last Name	Pacholski
Contact Phone Number	905-882-7234
Request Account Amount	100000
Credit Score	800
Product Name	Labels
Pricing Code	23
Comments	Reject 
Credit Rating	
Pricing Score	
Credit Report Needed	true
Credit Risk	HIGH
Application Decision	true

___l. Click the **Complete** button.

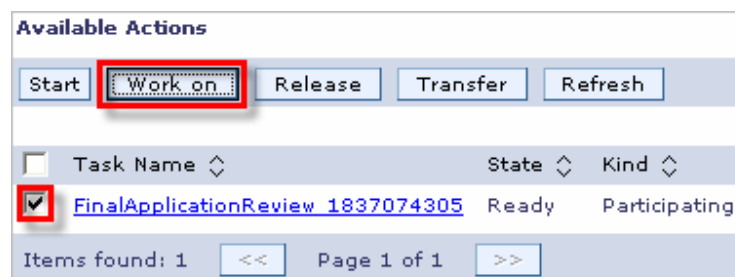


___m. In the Business Process Choreographer Explorer, click the **Refresh** button.



In the right pane, you should now see an instance of the Final Application Review Human Task.

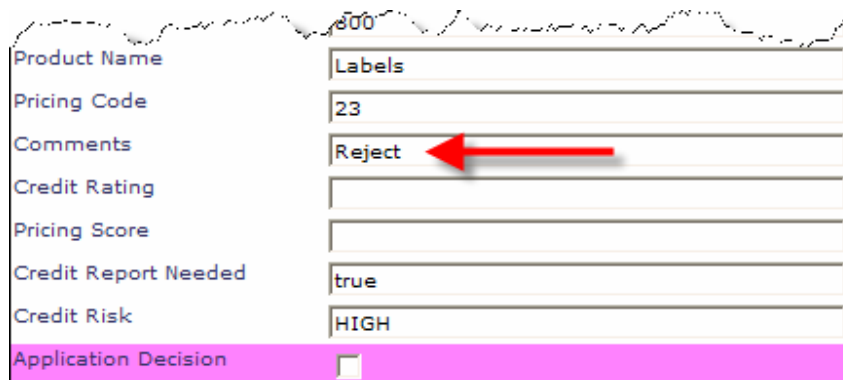
___n. Select check box of the **FinalApplicationApproval_1837074305** Human Task instance and then click the **Work on** button.



The JSP for providing the input and output for the Human Task appears.

___o. In the Final Application Review JSP note that the Comments field contains "Reject".

In the JSP make sure **not to select** the Application Decision checkbox.



Product Name	Labels
Pricing Code	23
Comments	Reject
Credit Rating	
Pricing Score	
Credit Report Needed	true
Credit Risk	HIGH
Application Decision	<input type="checkbox"/>

___p. Click the **Complete** button.



Wait for a few moments and then examine the Console view below the BPC Explorer window. You should see in it a message from the Provide Pricing & Approval component:

```
[Java] Generate Decline - begins
[Java] Generate Decline - Account verification for customer ACME was not successful.
[Java] Generate Decline - ends
```

This message indicates that the process successfully completed the “Complete Path” test.

- ___q. **Add and Remove Projects...** from WPS to << **Remove All** projects from the server.
- ___r. **Stop** the server.
- ___s. Exit **WebSphere Integration Developer**.

Congratulations! You have successfully completed Lab 2.

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